9

BULLETIN OF THE

TAYLOR SOCIETY

AN INTERNATIONAL SOCIETY TO PROMOTE THE SCIENCE
AND THE ART OF ADMINISTRATION AND OF MANAGEMENT

December Meeting Papers:

The Naumkeag Experiment
Distribution Problems
Men, Not Things
Stores Room Control
Standardization

Foreign and Other Contributions

Engineering Societies Building
29 W. Thirty-Ninth St.
New York

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APRIL, 1930 VOL. XV, NO. 2

Objects of the Taylor Society Incorporated

The objects of this Society are, through research, discussion, publication and other appropriate means:

1. To secure—for the common benefit of the community, the worker, the manager and the employer—understanding and intelligent direction of the principles of administration and management which govern organized effort for accomplishing industrial and other social purposes.

2. To secure the gradual elimination of unnecessary effort and of unduly burdensome toil in the accomplishment of the work of the world.

3. To promote the scientific study and teaching of the principles governing organized effort, and of the mechanisms of their adaptations and application under varying and changing conditions.

4. To promote general recognition of the fact that the evaluation and application of these principles and mechanisms are the mutual concern of the community, the worker, the manager and the employer.

5. To inspire in labor, manager and employer a constant adherence to the highest ethical conception of their individual and collective responsibility.

Membership

The membership of the Society comprises Members, Junior Members, Honorary Members, Life Members, Firm Members, Contributing Members and Student Associates. Application for membership should be made on a regular form which may be secured from the Society. New members may be elected directly to the grades marked*.

1. **Member*: An individual interested in the development of the science and the art of management as engineer, executive, operative, scientist, investigator or teacher. Minimum age 28. Initiation Fee, $15. Annual dues including subscription to the Bulletin, $20.

2. **Junior Member*: A younger member. A Junior Member may become a Member without payment of additional initiation fee at 28 years of age and must change to Member at 30 years. Initiation Fee, $5. Annual dues including subscription to the Bulletin, $10.

   For any of the above grades a person engaged in educational work, state service, government service or the service of any other non-commercial enterprise of an eleemosynary nature shall pay one-half the initiation fee and one-half the annual dues of the grade to which elected.

3. *Honorary Member*: A member elected by the Board of Directors for exceptionally distinguished service in the advancement of the science and the art of management.

4. **Life Member*: Any Member who has prepaid all dues by the payment of $500.

5. **Firm Member*: A firm or organization interested in the advancement of the science and the art of management which desires to make the service of the Society available to members of its organization. A firm member designates two representatives (who may be changed from time to time at the organization's discretion) who have all the rights and privileges of membership except the right to vote and to hold office. Annual dues, including two subscriptions to the Bulletin, $40.

6. **Contributing Member*: Any individual, firm or organization desiring to promote the work of the Society by an annual contribution of $100 or more. A contributing member has all the privileges of personal or firm membership, as the case may be, including one subscription to the Bulletin for each $20 contributed.

7. **Student Associate*: A regularly enrolled student of management in any school of engineering, business administration, commerce or arts, of collegiate rank, or a graduate of such institution who has applied for membership not later than one year after graduation, elected upon recommendation of the instructor in charge of management courses. A Student Associate may become a Junior Member, without payment of initiation fee, any time after graduation and must become a Junior Member at the age of 25. Annual dues including subscription to the Bulletin, $3.

All dues are payable in advance, either annually or in semi-annual instalments. The fiscal year is November 1 to October 31. Members elected other than at the beginning of the fiscal year are charged pro rata (quarterly) for the first year.

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Comment

BY MAKING this as well as the preceding issue extra size we have nearly completed publication of the noteworthy papers which were presented at the December meeting. We believe that by reading the last three issues those who were unable to attend the meeting will understand why participants appraised it so highly. The unpublished paper—Colonel Hathaway's "Methods Study"—is being revised and enlarged and will be printed in a special number.

BECAUSE of present interest in unemployment the papers describing "The Naumkeag Experiment" will be read with special attention. The researches being conducted at the Naumkeag mills by a management engineer under the joint auspices of management and organized labor were inspired by the desire to reduce unit costs and otherwise increase competitive strength without unnecessary discharge of workers. As we understand the situation the primary objective is to devise, in the light of all data discoverable by research, a policy and program of readjustment which shall carry the approval and consent of the workers concerned.

IN A RECENT address Henry P. Kendall, President of the Taylor Society, made a statement which expresses precisely the point of view which has guided the activities of the Taylor Society in determining the programs of meetings, the content of the BULLETIN, co-operative activities and the work of the Society generally. We quote, the italics being ours: "I am convinced, from my observations of American business and industry as a manager, that *sound principles* of management are needed today more than ever before. Economic conditions are tightening. Inefficiency is not a matter of mechanics or methods primarily. A grasp of *principles* and a sound *philosophy* are the root of the matter. Given these, the mechanics and methods in any particular situation should be right, provided there is a knowledge of the best technology. Our future prosperity can be safeguarded in no other way than by getting down to the *bedrock of basic principles* and making our applications, not in imitation of others, but out of those creative resources which are kept alive by contact with *basic truth.*"

Fiftieth Anniversary of A.S.M.E.

Organized April 7, 1880

WITH ceremonies worthy of a great institution, The American Society of Mechanical Engineers has this month celebrated, in New York and Washington, April five to eight, the fiftieth anniversary of its founding.

The Taylor Society has already extended its formal congratulations. The text of its engrossed greetings, presented by its delegates at a ceremony at which similar greetings were received from organizations of many countries, is as follows:

TO THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS—GREETINGS:

At these formal exercises to celebrate the Fiftieth Anniversary of the founding of The American Society of Mechanical Engineers, the undersigned have the honor and pleasure to present the filial greetings of Taylor Society Incorporated, an international society to promote the science and the art of administration and of management and to commemorate the creative work of Frederick Winslow Taylor, president in nineteen hundred six of The American Society of Mechanical Engineers. On this happy occasion we felicitate the officers and the membership of The American Society of Mechanical Engineers on the completion of a half century of distinguished work in the development and expansion of the content of mechanical engineering and in the application of this knowledge for the benefit of mankind.

H. P. KENDALL
President

MORRIS L. COOKE
Official Delegate

H. S. PERSON
Managing Director

EDWARD EYRE HUNT
Official Delegate

We are stimulated to say more than could properly be included in a formal greeting. In addition to congratulations we desire to express the indebtedness of all who are interested in the art and in a science of management for the creative work of A.S.M.E. in that field, and of the Taylor Society in particular, for the helping hand it has from time to time received from A.S.M.E.

It was on the forum offered by meetings of A.S.M.E. and by technical journals identified with it that the management movement in American industry had its origin. We are accustomed to cite Henry R. Towne's paper "The Engineer as Economist" (1885) as a convenient milestone to mark the beginning of that movement. For nearly twenty-five years A.S.M.E. remained practically the only influence in the development of a science of management. Then expansion of the content of mechanical engineering—one result of the creative work of A.S.M.E.—compelled that Society about 1907 to begin to give relatively increasing attention to pure engineering and less to management, and the latter field soon became the concern of the specialized Taylor Society organized by a small group, particularly interested in management, within A.S.M.E.

It was discussions at meetings of A.S.M.E. which stimulated Taylor to rationalize the significance of the procedures which he had developed at Midvale and Bethlehem; and "A Piece Rate System," "Notes on Belting," "Shop Management," "On the Art of Cutting Metals" and important papers of Gantt, Emerson and Gilbreth were stimulated by its meetings.

When in 1919 the Taylor Society decided to establish an office, it was A.S.M.E. which gave it its first home. Through the courtesy of its Secretary, Calvin Rice, the personnel (consisting of the managing director and a stenographer) and the equipment (consisting of two desks and a file) of the Taylor Society were given a temporary location in one of the large offices of A.S.M.E. Since then many other courtesies it has been our privilege to receive from Mr. Rice and his associates.

Therefore at the same time that we congratulate we also express gratitude to The American Society of Mechanical Engineers.

We should be remiss if we should fail also to congratulate the Society on the excellence of the program of the anniversary celebration and on the scientific management evident in the planning for it and the precision with which the schedule was carried through. Living in the same building, we have witnessed the months of preparation. Throughout the entire gamut of personnel—from Council to the humblest messenger boy—the planning and execution have been that of a highly co-ordinated, well trained organization. We once believed that the planning and execution of the entertainment by the Vereine Deutsche Ingenieure of several hundred members of A.S.M.E. in 1913 was the high water mark of excellence in the planning and conduct of such an enterprise. A succession of later experiences, of which this anniversary celebration is the latest, leads us to believe that excellence is not to be attributed to nationality but to engineering technique, by whatever national group it is employed.

The Naumkeag Experiment

A Case of Employer-Worker Co-operation in a New England Textile Mill

The Management Point of View[1]

By J. FOSTER SMITH
Agent, Naumkeag Steam Cotton Company, Salem, Mass.

Mill History

THE disastrous embargoes on American shipping during the Napoleonic Wars and the War of 1812 had a direct bearing on the establishment of a cotton mill at Salem, Massachusetts, in 1839. During the embargoes hundreds of ocean-going ships lay rotting alongside the wharves of the historic town, with their seamen scattered wherever employment could be found. Many old and famous concerns went out of business, or transferred their affairs to the rapidly growing city of Boston, or the already outstanding city of New York, when the embargo was lifted. The commerce of Salem received such a setback that it never revived. Ship-owners, shipmasters and merchants began to look about for other investments. Their attention was naturally drawn to the new and successful industry of cotton spinning and weaving, as carried on along the Merrimack and Charles Rivers in Massachusetts and the Blackstone Valley in Rhode Island. The logical result of their investigation was the establishment, in 1839, of the Naumkeag Steam Cotton Company on the harbor front.

At that time, ninety years ago, this was a unique location for a cotton mill, since it had no water power, the universally used motive force in those days. The humid atmospheric condition always found about a water course, and so essential to the successful manipulation of the cotton fibre, was also lacking. The proponents of the scheme figured, however, that with the new fuel, coal, power could be generated cheaply enough to compete with the water wheel, and the proper atmospheric condition would be afforded by the rise and fall of the tide. Whether their calculations were correct or not, it is a fact that the required funds were raised and in 1845 the mill was in active and successful operation. With addition of buildings and machinery from time to time, its prosperous career was continued until June 25, 1914, when the entire plant was totally destroyed in the great fire.

Immediately after the conflagration, rebuilding operations began on the same site, and in a year and a half a new Naumkeag was in full operation, with an equipment of about the same capacity as the old plant. This new Naumkeag was of improved reinforced concrete construction, with special attention paid to the details of light, ventilation, sanitation and everything that might contribute to the well-being of the operatives. The machinery was of the latest design, largely automatic and electrically driven. Although this equipment is less than fourteen years old, the management has already made large replacements, and consistently throws out old machinery as fast as more efficient or more economical machines are tested and proved.

After numberless visits to establishments in this country—North and South—in England and on the continent, I consider Naumkeag an outstanding cotton factory, as far as lay-out, co-ordination of operation, and efficiency are concerned. Were I commissioned to build a mill of the same capacity today, I would find it difficult to improve on a single essential part of the present plant.

Its Product

The Naumkeag has always specialized in plain sheetings. Even in the first year of its operation it was awarded a medal, at the Annual Exhibition of the Massachusetts Charitable Mechanics Association, for the excellence of its product. Previous to 1860 the mill began to pay special attention to the weaving of wide sheeting, developing a fabric with a carefully worked out organization of sley and pick, warp and woof—an organization and quality which has been sacredly maintained through the generations. Extensive and long-sustained tests made seventy years ago, and continued up to the present time, have demonstrated conclusively that this fabric, woven with 68 sley, 72 picks, average 22s yarn, of the proper cotton and of specially determined twist, is an exceedingly well-balanced sheeting. It wears well and is easy to launder. As Pequot sheeting it has become a household word in millions of homes.

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[1] Paper presented at a meeting of the Taylor Society, New York, December 6, 1929.

Many years ago the Naumkeag initiated the custom of supplying the housewives with bed linen made up ready to use. Now the integrity of its product and the prestige which the name has acquired through consistent national advertising have made Pequot sheets and pillow cases by far the most popular line in America.

Its Employes

There was always a sprinkling of trained spinners and weavers from England and Scotland to form a nucleus of operation at the Naumkeag mill but the original employes were mostly native born and residents of Salem. A good many of the girls came in from the country near Salem, glad enough to earn some real money in the days when there were few opportunities open to women.

The lives of the early operatives were under rather rigid control. They were expected to attend church on Sunday and the mill bell rang a curfew at nine o'clock each evening when everyone was supposed to be off the streets. The hours of labor were excessive and, judged by present standards, the pay was deplorably small. All manufacturing establishments were then woefully lacking in proper lighting, ventilation, locker rooms, medical attendance and all the things the present-day employe has learned to regard as a matter of course. The Naumkeag, however, even in those old days, was far in advance of the usual cotton factory.

It may be interesting to hear what Mrs. Robinson, who was herself a mill worker, wrote of living and working conditions in Lowell, eighty-five or ninety years ago.

"Except in rare instances, the rights of the early mill girls were secure. They were subject to no extortion: if they did extra work they were always paid in full, and their own account of labor done by the piece was always accepted. They kept the figures and were paid accordingly.

"Their life in the factory was made pleasant for them. In those days there was no need of advocating the doctrine of the proper relation between employer and employed. Help was too valuable to be ill-treated.

"Their surroundings were pure, and the whole atmosphere of their boarding houses was as refined as that of their homes.

"The health of the girls was good. The regularity and simplicity of their lives and the plain and substantial food provided for them kept them free from illness."

It was not many years before this native help gradually left the mill. Their places were largely taken by Irish immigrants. They in turn entered other industries or occupations, and their places were taken by French Canadians who began to come to Salem in the 70s. In the 80s and 90s the so-called Polish people came in large numbers, so that at present our mill operatives are about half and half of these two nationalities. They are industrious, prudent, self-respecting, property owners, many of them naturalized. The children and grandchildren of many of our early foreign employes are now on the payroll.

Wages

Wages have always been fair, and of late years very much higher in rate than in any cotton mill in the same line of work. Two recent reductions in wages, of approximately 20 per cent, were not made effective at the Naumkeag, as the management believed an adequate profit could be earned on the old rate of wages at the time. Jobs have been so adjusted that a proper fatigue period has always been provided.

The management has consistently given its employes four things, which it believes of paramount importance to the efficiency and well-being of its help—continuity of employment, the best possible stock and working conditions, the best possible wage, and some provision for old age.

Industrial Relations

From the very first relations between the management and employes were friendly. In the early days, in common with every other cotton factory, as has been stated already, there was a rather rigorous paternalism on the part of the corporation, which controlled not only working conditions but, to a certain extent, living conditions as well. However, as far as the mill in Salem is concerned, this paternalism was never offensive or dictatorial, and passed out almost entirely with the change in personnel from the original native born to the later mixture of several nationalities, with individual and race customs, prejudices and religious beliefs.

As is bound to happen in all human relations, so at the Naumkeag in the first seventy-five years there had been a few inevitable differences, of one sort or another. None of them was of any particular moment resulting in material losses in production and wages to the two parties at odds. It was not until the fall of 1919 that a real walk-out occurred—just eighty years after the establishment of the company.

This strike, precipitated by a demand for an increase in wages which the management could not then grant, lasted several weeks and was marked by a total absence of discord or disturbance. It was amicably settled to the satisfaction of all concerned after a number of conferences between the management and the representatives of the Union. With the resumption of work began a closer co-operation between employer and employe, and a united effort for quantity and quality production. Added to this was a sincere effort on both sides to eliminate, or at least alleviate, the causes of friction, misunderstanding, resentment, which are bound to occur in an industry employing two thousand five hundred hands, and obviously out of the individual control of the general manager. A punctilious regard for seniority rights was exercised which helped the morale tremendously.

A further extension of the co-operative spirit came about when the management and the Union, through their legally qualified officers, signed an agreement, the main object of which is the removal, as far as possible, of all causes for misunderstanding and friction, and the promotion to the greatest possible degree of a mutual helpfulness between the two organizations. This agreement will later be discussed in detail by Mr. O'Connell.

The agreement recognizes the desirability of the trade unions, the spirit of co-operation in promoting the continued and successful operation of the mills; pledges the co-operation of employes in effecting such economies in manufacturing as may be brought about by the introduction of improved machinery; provides for a proper and orderly holding of conferences in the event of differences which may arise in the natural course of the operations of the mill and bleachery, and further provides for regular meetings between the management and the representatives of the Union—an eminently fair agreement which has worked out excellently.

The Present Problem

Some months ago the management brought to the attention of the Executive Committee of the Union the fact that the Naumkeag, due to the lower costs of its competitors, was put to most serious disadvantage in marketing its product, and that its cost of production must be brought to a figure comparable with mills making an identical line of goods. To this end the management, believing an industry can prosper and give employment to its workers only to the degree to which it is economically in balance with industry as a whole, presented a new schedule of labor and wages. This schedule provided for a rearrangement of work in every department, and inevitably predicated the elimination of a considerable number of operatives. On the other hand it provided that no wages would be reduced. In other words, this reapportioning of jobs in each case carried with it an increase in pay and stressed the further belief of the management that no employe who is doing a fair day's work should have any addition made to his task without some commensurate improvement in working conditions. The schedule was worked out by the supervising executives from their intimate knowledge of the jobs, and not by factual tests.

Several conferences were held, as a result of which the Executive Committee of the Union realized the necessity for a reduction in costs. They hesitated to act in the matter, however, and it was here that they took, through Mr. O'Connell and the President of the Union, an unusual, and perhaps a unique, step. They visited one of your good members, Mr. Morris L. Cooke, at his home in Philadelphia and there lay before him their problem and asked his advice.

The result of this visit and of his counsel was the employment, by the Union, of another of your members, Mr. Francis Goodell, who, with the consent of the mill management, made a fortnight's survey of lay-out, operations and conditions. His report to the Executive Committee resulted in an agreement, relating definitely to the new schedule previously mentioned, providing for the employment by the Company of a trained technician, and for the appointment of a committee representing the management and the Union to act with him in the making of tests on a factual basis. The object of these is the elimination of waste—both of labor and materials and an ultimate reduction in cost. The agreement further provides for master planning on the part of the management, for the budgeting of sales and for the forecasting, as far as is humanly possible, of continuous operation. This later agreement under which employer and worker are co-operating will be presented and discussed by Mr. O'Connell and Mr. Goodell.

The Real Problem

This matter of employer-worker co-operation, as far as the management is concerned, involves the viewpoint of several interests—the stockholders, as represented by the Board of Directors; the Company executives, including the treasurer, the agent and superintendents, and the overseers and second hands, who are naturally most intimately associated with the employes. Given a group of directors with an adequate conception of the results which must be achieved, and in addition a real interest in the entire personnel of the corporation, given a forward-looking executive force heartily in accord with the object of this co-operative effort, and finally, a group of overseers and second hands imbued with the real spirit of the undertaking and manifesting from the first an intelligent idea of what it is all about—given all these, the problem as far as the employer is concerned is not insuperable.

On the part of the Union, as represented by its officials, an exceptionally fine attitude has been evidenced consistently. They have shown an apparent real appreciation of this unusual project and a sympathetic attitude toward the objectives of the management.

The real problem is the winning over of the workers to a realization of the true situation, an understanding of the reason for studies and tests. They must be so educated that, when the facts are established by the research committee, there will be a whole-hearted acceptance of the findings and willing assumption of a job in accordance with them.

It is apparent that this lack of education is a real problem. It is manifested by an open reluctance of operatives to work on a test, and the covert opposition of many who, by obvious means, try to deter a fellow workman from a fair and square endeavor to play the game. This lack of intelligent co-operation is due to many causes. Not the least of them is the traditional, one might almost say the hereditary, suspicion of the average mill operative toward anything that seems to come from the management. In the old days employer and employe each regarded the other as a natural and inevitable enemy. Happily this condition is now in a fair way toward the discard. We are on the threshold of a new era. There are more steps to climb before easy going is reached, but it is with a most sanguine feeling of the ultimate success of our employer-worker co-operative effort that we present this picture of our progress to date.

The Union Point of View[2]

By JOHN P. O'CONNELL
Secretary and Business Manager, United Textile Workers of America, Salem, Mass.

THE TERM used to cover this case of employer-worker co-operation is Union-Management-Co-operation between the United Textile Workers of America and the Naumkeag Steam Cotton Company of Salem, Massachusetts, manufacturers of Pequot sheets and pillow cases.

In June, 1918, a strike occurred within the Naumkeag spinning and carding department, employing three hundred workers. A local union was organized and chartered in the United Textile Workers of America and the machinery for dealing with the management established. Agreement was reached at the end of five days to return to work and submit the entire controversy to arbitration under the auspices of the Massachusetts State Board of Arbitration.

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[2] Paper presented at a meeting of the Taylor Society, New York, December 6, 1929.

In the fall of 1919, 75 per cent of all workers were members of the Union, and demanded its recognition with collective bargaining in its fullest sense plus a general increase in wages. After a seven weeks' strike, a conference was called and the management and Union officials agreed upon: (1) recognition of the Union; (2) a minimum wage for women; (3) collective bargaining; (4) withdrawal of the wage increase; (5) a system of dues collection within the mill, and (6) the establishment of a shop committee and foreman conferences to adjust grievances. A remarkable thing about these two early struggles was the spirit manifested by both sides. Neither side is today ashamed or embarrassed by any act of its membership.

Mr. J. Foster Smith on both occasions closed the plant and never resorted to injunctions, yellow-dog contracts, or other methods used to destroy the effectiveness of the Union. The Union membership likewise took a responsible attitude toward such management problems as the creating of standards of wages and working conditions, consultation on discharges, adjustment of grievances between foremen and shop committees. This was considered reasonable because it was believed that such an attitude would assist in improving morale and in stimulating a real everyday interest in jobs. And it did.

Next followed an agreement to accept seniority rule as a means of still further improving morale. It is believed that honest effort in quality and quantity production is rendering faithful service, and is entitled to reward in the form of promotion as well as in security of job.

The next co-operative step was reduced to writing in the form of an open covenant. We believe the agreement between the United Textile Workers of America and the Naumkeag Steam Cotton Company to be an embodiment of the striving toward industrial progress.

The Agreement

Agreement by and between the United Textile Workers of America, through its legally qualified officers, party of the first part, and the Naumkeag Steam Cotton Company, of Salem, Massachusetts, through its legally qualified officers, party of the second part, with the object of removing, as far as possible, all causes for misunderstanding and friction and of promoting to the greatest possible degree the mutual helpfulness of the two organizations.

First: The party of the second part agrees to a cordial and full membership recognition of the bona-fide trade unions of its employes, known as party of the first part, as their proper agents in matters affecting their welfare, and further agrees that these trade unions are acceptable. It recognizes them as desirable, not only in regard to the welfare and protection of their members, but also desirable to the management, inasmuch as the co-operation of their members is essential to the continued and successful operation of the Mills.

Second: The party of the first part agrees to promote in every legitimate way the distribution and sale of "Pequot" sheets and pillow cases, and other products of the party of the second part, and pledges its support in a constructive and responsible way to the end that quantity and quality production may be maintained, and further pledges its co-operation in effecting such economies in manufacturing as may be brought about by the introduction of improved machinery.

Third: The party of the first part realizing that continuity of operation is essential to the successful operation of the Mills, agrees that in the event of differences which may arise in respect to details of operation, compensation, hours of labor, working conditions, or any other matter of controversy between the management and the employes, a period of not less than sixty days shall be allowed for the proper and orderly holding of conferences between the management and the executive or other committee of the Union, and further agrees that no action tending to disrupt production shall be taken before the expiration of the said period.

In the event of the unauthorized cessation of work by an employe or group of employes the said party of the first part agrees to use every effort at its command to assist in maintaining continuous operation.

Fourth: The party of the second part appreciating the advantage of a spirit of co-operation and loyalty inspiring the personnel of its employes, and desiring to further cement the feeling of friendly and sympathetic understanding, agrees to use every effort to maintain good working conditions, fair wages and continuity of employment.

Fifth: Representatives of the party of the first part shall meet with the representatives of the party of the second part at regular intervals, preferably once a month, or as often as necessity may require, for the discussion of any questions that may arise and for the further extension of a spirit of loyalty, helpfulness and co-operation.

Sixth: This co-operative agreement is binding upon both parties in spirit as well as in letter, and shall be changed only by mutual agreement, after notification in writing, served by either party upon the other at least sixty days before such change is to become effective.

Seventh: This agreement shall be operative for the period of one year from date of acceptance, and either party may withdraw from this agreement on sixty days' notice.

Signed, sealed and delivered this day of
.................................A. D. 1927

SIGNATURES

For the Naumkeag Steam Cotton Company
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....
....

For the United Textile Workers of America
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....
....

With this joint machinery in effect, monthly conferences started to discuss competition in manufacture, sales and markets, quality and quantity production, regularization and continuity of employment, technical changes and economies to be effected through new and improved machinery. A very different procedure is employed from that in use under other systems, such as the various forms of Company Union. This agreement provides checks and balances but preserves the right to collective decision.

This collective decision clause, as found in Article 7, demonstrated its effectiveness when the Union and the management found themselves undecided as to the proper procedure in a general cost reduction program. At this stage the Union felt that the application of scientific minds to the problem was necessary and sought the counsel of one of your members, Mr. Morris L. Cooke, who in turn had Mr. Francis Goodell, another member of your Society, make a survey of the situation. As a result the union submitted the following proposals which were agreed upon by the management.

Tentative Draft Regarding Proposals

January 30, 1929

The proposals of December 13 and December 26, 1928, show an unused opportunity for joint effort toward cost reduction. The Union sees the importance of reducing the cost of manufacture and agrees that proposals of the nature of these under discussion mark progress toward this goal. But such proposals should have been made piecemeal—for each separate operation, as the idea was developed, instead of accumulating a number of independent proposals and urging their simultaneous adoption.

By such individual consideration economies are realized earlier and without prolonged friction and relatively few adjustments are forced upon employes at one time. For a large number of employes to be released at one time is a very heavy drain upon local prosperity as it takes months for many of them to get relocated in a flooded market; whereas the same number of readjustments may be made without loss if there is suitable machinery to decide upon the changes a few at a time. The situation which has arisen shows that we still lack suitable machinery for bringing up possible waste reductions and for considering and effecting them without disorganization.

Section 1: *The Proposal Proper.* The Union proposes that each question under discussion shall be settled separately and upon the basis of analytical research. It is believed that this analytical approach will not only settle these points now at issue, but will supply elemental facts leading to other forms of economy, aid in the selection or rejection of new equipment, and above all, give practice to both parties to our agreement in discussing upon a factual basis matters at issue.

a. This research work should be headed by a technician employed by the Company. The Union would accept someone recommended by Mr. Morris L. Cooke as having the requisite viewpoint.

b. It is also proposed that the present machinery for discussion be supplemented by a committee on waste elimination. This committee would act, or appoint individuals to act, as aid to the above-mentioned technician, and have the power to review the facts leading up to decisions relating to manufacture recommended by the technician. This committee confines itself to such constructive proposals, under provisions somewhat as follows:

"The parties to this contract (or agreement), recognizing their common stake in eliminating waste, and realizing that wasteful practices generally result, not from intention but from lack of common understanding of such practices and their injurious effect upon both earnings and wages:

"Hereby agree to set up a joint research committee composed of three (four or five) representatives of the management and three (four or five) representatives of the Union, whose duty it shall be to ascertain the facts and to devise methods of co-operation for the elimination of waste and the improvement of working conditions as related to quality and quantity of production. This research committee shall in no case entertain complaints or grievances, but shall concern itself exclusively with constructive suggestions for the promotion of the common interest of the parties signatory to this agreement in eliminating waste."

This committee should be furnished not only with relevant figures obtained by research but it should also be furnished with factors of the major cost and quality problems arising from competition which confront the management. It will then be possible also to indoctrinate the employes at each operation with a concrete picture of their part in the goal, to wit, costs and quality which enable "Pequot" to compete successfully.

c. Although the employes may realize at times that the costs must be upon a sound basis, they do not have any way of knowing the effect of their output upon the costs nor any goal which is present at all times. There is a psychological need for concrete and immediate facts of this nature if habits of economy and pride in achievement are to be further developed.

This procedure, first of research and second of joint factual consideration, will furnish the machinery for sufficiently frequent and constructive discussions. This is now lacking and to this lack is due the dilemma with which both parties are now faced.

Section 2: *Master Planning.* The Union realized that the elimination of waste in its several forms is partly dependent upon other considerations than this matter of adequate machinery for constructive discussion. They cannot indefinitely continue to endorse a program which will reduce the labor requirements per unit without reasonable assurance that the sales problem is being met in the same forward-looking and resourceful spirit. At present they are concerned about the distribution in a time of unprecedented change in this field. They can co-operate fully upon the basis that, humanly speaking, the future sales are under control, and that plans are made ahead for preventing sudden drops in production due to failure to forecast sales, and to co-ordinate the forecasts with the labor requirements in terms of the next succeeding years.

This need for reasonable security is the foundation for continuing co-operation, as Mr. Morris L. Cooke wrote in a recent article:

"To manufacture effectively the working force must be backed by an effective sales force and a socially-minded sales policy. In other words, an industrial establishment is an organism, and each function must operate in harmony with all the others. Little is gained by special pressure at one point if it is not related to the common effort. . . . Far-sighted employers are coming to look upon continuous employment as one of the first requirements of good manufacturing and are learning how to provide it. In such plants the workers have every incentive to give to waste elimination their whole-hearted allegiance."

If there is not now the necessary sales planning to give assurance to the employes, this lack should be the major concern in order that the place of "Pequot" in the market may not be injured by the many powerful changing elements in the field of distribution—the increasing chain store development, the general dissatisfaction with and review of present sales methods, the introduction of new basic fabric and the intensive study of product design.

Section 3: *Unemployment Reserve.* In the event that this sales planning is adequately carried out, it should become possible for the management to develop plans running at least a year or two in advance, which provide for an even or increasing staff coupled with a decreasing cost. The Union feels that steps should be taken to work out a financially sound unemployment reserve fund. They do not insist that this fund be started at once, but believe that with a competent sales planning function, which is integrated with the other administrative functions of financing, buying, manufacturing and planning labor requirements, such a fund will not be a drain upon the Company. On the contrary, it will give two vitally important benefits; first, it will provide a valuable stimulus to continuing and far-sighted sales administration, and second, it will liberate an unprecedented degree of co-operation.

In addition, such a fund should not mean a heavy outlay. With adequate control of the distribution problem, the amount expended may be trivial. And the financing may be made conservative by limiting the amount of liability to the amount of the reserve.

To sum up, the Union believes that the Company can supply conditions which will cut waste in line with their proposals by supplying the machinery for constructive discussion, by getting and giving out the facts relative to the cost requirements, and supplying in some way the confidence that lower costs will not only work to the ultimate benefit of all concerned, but that readjustments within the Company, or from the Company to other companies, will be made in conformity with the practical needs of the employes.

Mr. Goodell has been with us since February and progress has been made. With the fact-finding, fact-facing and fact-using program carried onward, the Union feels that it can jointly and co-operatively aid in reducing costs of operation, which should in turn result in a larger volume of sales, provide increased profits and wages, with regularization and continuity of employment.

The Union is co-operating in and promoting a sales program for the aforesaid reasons.

We as a Union have made every effort to organize our competitive non-union workers and in almost every case have met with the usual tactics —discharge of the leaders, followed by strikes settled only on a condition. It seems to me that the textile manufacturers have no evidence in the way of profits or improved conditions to warrant the continuance of this policy. They might do well to try instead building up the labor organization within their plants.

The case for the Union-Management program is well stated in the *American Federationist* of February, 1928, "A Challenge to Employers and the Public."

"The constructive policies of organized labor in the United States challenge the owners and management of industry to co-operate with it in the establishment and maintenance of sound economic standards and industrial peace. We welcome the opportunity of giving our collective skill, training and technique to the development of industrial and individual efficiency. We believe that American living standards and national prosperity can be fostered only through the maintenance of a high industrial productivity level and a high and still higher mass purchasing power.

"The real problem will be that of financing commodity consumption. Not only must the consuming mass of people be encouraged to buy but they must be financed to the point where they can buy freely.

"How will the owners of industrial enterprises meet this challenge? Will they accept organized labor's offer of co-operation? Will they assist in the giving of new force and meaning to collective bargaining so that all concerned may think in terms of industrial peace and of the peaceful solution of industrial problems which affect the relationship of employers and employes?

"Team work on the part of employers and employes is a very desirable thing, but before it can be a practical reality there must be a will to work together and a frank recognition of and respect for each other's rights.

"Opposition to the American Federation of Labor and its constituent parts through the organization of company unions, the use of court injunctions and the arbitrary denial of the exercise of the right of employes to join the labor union of their choice tend to fan the flame of industrial conflict and to widen the breach between employers and employes. Will those employers who have been pursuing such an opposition policy during the past continue to do so in the future?

"The experience of the past can be repeated or a new era of industrial good-will can be ushered in. Corporations can experiment with company unions and various brands of welfare plans and in this way can oppose the standard, independent trade unions, as represented by the American Federation of Labor, or they can accept our offer of co-operation and service.

"Which shall it be? The answer must come from the employers of labor."

The Technician's Point of View[3]

By FRANCIS GOODELL

**Industrial Engineer, Naumkeag Steam Cotton Company,
Salem, Mass.**

MR. SMITH and Mr. O'Connell have brought the story down to date. They have pointed out that a union has *initiated* the employment of outside engineers and that the Union has raised the issue of adequate safeguards for the future of Pequot demand. These are two outstanding and perhaps unprecedented developments in industrial history. The Company has underwritten the very heavy expense of outside counsel upon several points and is paying the wages of two Union representatives who work full time to protect the Union against any unfair decision. To my mind, the beauty of these conspicuous moves is that each side is doing these unprecedented things in its own interest. There is a certain vigor about the relationship.

It is up to me to describe our joint research in more detail and then to tell what joint research asks of each party—the managers and the Union membership—and what it offers each.

The job of joint research is "to ascertain the facts and devise methods of co-operation for the elimination of waste and the improvement of working conditions as related to quality and quantity of production." Put in terms of Naumkeag at this time it means—to look into the question of extension or stretch-out methods and to determine fair job standards. What justifiable extension means may require a minute of explanation. In most industries you talk output. In ours, we talk extension. Most of the operations may be described as continuous and the chief question is, how many machines can an operator handle? If a weaver has twelve looms, can his job be extended to sixteen or twenty? With reservations, the output will take care of itself. And incidentally our output is extremely high, a factor which partly compensates for our relatively high wages.

Why should extension so suddenly become an issue over the whole East and South? It is the result of better maintenance and operation control. If the given looms have a large number of unexpected stops per hour, naturally the weaver has got to be on hand to provide for these emergency breakdowns. If he has to be on hand ready for an emergency, then he might as well do the incidental work around the loom while he is waiting, because this incidental work can be *set aside* when the emergency comes. Incidental work consists of cleaning the looms, taking out the finished cuts of cloth, "purling" the battery end of the cloth and oiling. These things do not have to be done on the instant. Therefore the weaver has until recently cleaned his looms and performed most of the incidental work. This is probably the best arrangement, if he has got to stick around for emergencies.

Now, however, the art of maintenance has taken a great step forward. It has been learned that there is an emphatic economy in *prevention* of these breakdowns, in periodic inspections and renewals. As a result the "end breakage" is much lower. Nearly every mill has, or is getting, a "bogie," as Mr. Kendall calls it. Recently we operated for a week at .65 stops per loom hour, and we are proud of it. They could not be that low if we did not have excellent machine conditions and piecing-up which is skillfully and faithfully done.

Now that the end breakage is low, the unexpected stops are almost negligible, and the weaver need no longer be assigned looms on the basis of serious trouble. He can, therefore, handle more looms. *How many* more depends upon whether he is still to do the incidental work around the loom. Some of this incidental work really requires help as skilled as the weaver himself. In such cases it is probably unwise for us to divide it. But some of it, like cleaning, can be done by a less trained and experienced worker, and at a lower wage cost. That cleaner can become expert—intensively trained in that single operation and equipped with tools well adapted to that one special job—and the other advantages of division of labor can be enjoyed.

A great many companies have tried to make extensions without improving and controlling the end breakage. They have usually failed to maintain their new standards. Others have made extensions without specialization by virtue of their improved maintenance. Their work has been less conspicuous, but it may have been equally profitable. It is a risky field in which to copy others without understanding the justification for extension.

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[3] Paper presented before a meeting of the Taylor Society, New York, December 6, 1929.

Next follows a description of our research machinery. I do not suppose we can give a very profound reason for the form it takes. It is, to some degree, a resultant of forces. And we are anxious to improve it. The machinery is not fixed by any unalterable agreement; in fact the charter, so to speak, for our joint research is nothing more than a tentative draft which neither side has signed. It was purposely left flexible. I am sure we can get some improvements from your comments, and I ought to say that a number of able manufacturers, industrialists and Union leaders have helped with their advice.

We have to keep in mind two pieces of joint machinery: the Waste Elimination Committee, sometimes called the Research Committee, *and* the Research Staff. The staff are all on the Waste Elimination Committee but, unlike the others, they give full time to research work. The committee is called together occasionally for advice and review of findings and as an additional medium for getting information from and to the body of employes.

The Waste Elimination Committee is composed of nine members. Its chairman is the Technician (myself at this time). The Technician is selected and paid by the Company, but the choice must be approved by Mr. Morris L. Cooke, the preceding president of this Society. The management members are appointed—the acting superintendent, the plant engineer, an overseer, and an extremely keen analyst who was night superintendent in the days when we had a night force. The Union members are the presidents of the two Locals—the United Textile Workers No. 33 and the Loom Fixers' Union No. 30—and two other members, one of whom is changed in accordance with the operation under discussion.

There are two ways in which the activities of the Waste Elimination Committee are spread among the rank and file. The best is the informal method whereby they are regularly and most of the time available for questions by the rank and file. The other is by means of posted notices telling about the meetings. I have made a practice of drawing up the gist of the meetings. The Company has them mimeographed, and then they are posted on the bulletin boards. Other copies are given to the interested parties for record.

Right here we are faced with a question: should we record all the "battles" we have, and the exaggerated statements, of which we are all occasionally guilty, which do not seem to help? If we do, then the result will be to muzzle the committee. If we do not, if we expurgate the proceedings, then we are chargeable with suppression of news. We need a vigorous committee; and after I have drafted a report of a meeting, both sides are allowed the blue pencil.

As has been brought out, the Union has gone on record as favoring the moves for economy, provided it is protected by representation in setting the standards. The vital part of this protection is here on the research staff. One or the other of the two members is engaged in every kind of study made. As I said, they are paid by the Company. Either side is willing to pay them; but I am told that the fact that the Company pays them is a tremendous earnest of the Company's good faith. These two Union representatives not only make time studies and other tests, but discuss with employes concerned any phase of the work of setting fair job standards. Most of the work is piece work, but our research ends with the settlement of the fair assignment. After the job standard has been made and reviewed, the payment, whatever its form, will be left to negotiations between the Company and the Union, just as in the years previous to this joint research.

The research work proceeds about as follows. After an operation has been decided upon for study, Union delegates and the overseer in the room concerned jointly select a number of *average* operators for study. We should prefer for several reasons to study first-class operators, and it is my hope that a few more studies will show us how we can use the first-class operators and yet allow a definite percentage of leeway which is labeled and clearly understood to apply to operators who are not yet first class, but who can and will be assisted to become first class.

In addition to the joint selection of operators to be studied we have to get into writing the tentative standard practices which are to obtain while making the tests and will presumably be adopted later for regular manufacture. More often than not these standard practices have to be changed as our studies throw light on the facts involved. For example, the interval which should elapse between examinations of the cloth on the looms is a matter of quality and cannot be set without the approval of those in touch with our sales problems. But the similar interval in the spinning room is a simple matter of economy which we determine without difficulty by a couple of tests. When we have our tentative standard practices in writing, the Union representatives go over them with operators in touch with the operations. There is not infrequently some valuable complaint or suggestion in regard to this standard practice.

When the standard practice is ready to adopt, the Union member goes to the operator, or operators, to be studied and tells him the purpose of the study, explains the value of Union protection in the study and the importance to him and his colleagues of telling the research staff of the difficulties which the operator is "up against" or is likely to be. In this way the genuine co-operation of the employe is usually obtained in a short time, especially when that operator becomes convinced that a thorough study is to be made and that the facts, as Mr. O'Connell puts it, are to be "faced" and "used" as well as "found."

We have had two sorts of studies. There are the formal tests of the machines in the exact way that they are to be manned and operated in accordance with the Company objectives. These are called "critical" tests. On some other tests we have had to fumble our way, learning what standard practices are economical, and sometimes showing the operative that some job is less than a fair standard for a day's work. These tests, "critical" or preliminary, are made where those who are concerned can see them. Such tests often carry more conviction in regard to the practicability of a given arrangement than would any assemblage of figures.

After a job is set in this way, the next step is the review by the Waste Elimination Committee. Now it has been established that this is not a voting matter. The Technician presents the figures and each side has an opportunity to criticize the details. Is any factor forgotten? What precautions have been taken against unforeseen delays? Up to what end breakage will the figures be usable? You see that the job of the committee members in this review is merely to present any objection. But the Technician decides as to the weight of these objections. Responsibility is thus kept single, and one of the main difficulties of the committee is swept away. Also the onus of any unpopular move cannot seriously be charged to any management or Union delegate. If the delegates have presented their views clearly and forcibly, they have done their part.

It may seem at first that considerable power is thus yielded—that the Union, for example, loses its prerogative of having a hand in settling jobs. But this is only true if the Technician closes his eyes to fairly obvious demands made by the delegates. If such were the case, the Technician would soon lose the confidence of that side, and presumably his job, if he did not learn to see fairly straight. If either side has the expectation of getting something for nothing, research, whether joint or not, will not help him to get it. At any rate, I believe that we get pretty much all of the advantages of free discussion without the handicaps of an executive committee, prolonged delay and divided authority.

For the rest I have recorded how joint research relates to the interests of the main groups involved, the management and the Union. Of course this is very much simplified. There are many interests involved in each. The labor leader's interest is not the same as his constituents', nor are the local interests entirely the same as the international. Similarly, the various management interests are different. The overseer has one interest (in most plants it is to keep off the carpet), and it is not always the same as the chief executive's.

What Joint Research Asks of the Management

1. Any company desiring to enlist the genuine co-operation of its employes must safeguard their jobs. No group of American workmen will help you saw off the limb on which it is sitting. But they will help you to save the tree. I need not here go into the moves we are making in this direction; but until we have a large measure of control of sales, and with it master planning, we shall have limited co-operation in spite of our joint machinery. As Mr. O'Connell brought out, the Company, recognizing this, has pledged itself to work toward an unemployment reserve fund and to establish it as soon as it can do so on a sound basis.

I am going to close this point with a quotation from a talk Mr. Kendall made nine years ago:

"So far as it has been my fortune to observe, the textile industry in this country does not know how to merchandise. In that industry success or failure today may rest upon the ability to merchandise.

"The emphasis is now upon selling. How can we build up a business? There are three essentials to selling: knowing your product, knowing the market, and *knowing the trade channels*."

And a little farther on:

"You cannot secure a control of sales until you have real merchandising, until you know what each department can do and at what cost, and what each market and each section of a market can take, all with respect to each product. Then you can develop quotas; then you can make budgets of sales and production; then you can develop budgetary and financial control."

2. Joint research also asks of the management that it should take seriously the question as to *what it wants done*—its objectives. Exactly what are its quality needs, exactly how much cleaning is to be done for each kind of frame or loom? Often joint research has to furnish data to help decide these questions. Our spinning standards were revised when the management learned the cost of their first attempt at a standard. But this clear-cut statement of the objectives is a tremendous stride toward economy, and an essential to satisfactory job standards.

Coupled with the merchandising work a cost objective also should be reached. The entire industry is handicapped because it has no uniform cost methods. In our case the most vital concern of the Company is costs—and it is a subject which figures dominantly in every discussion between Company and Union representatives. But, so far, we have not one reliable comparison between our company and any other. This lack means that the Union leaders have no satisfactory appeal to their constituents upon the subject, although without exception every responsible member would admit that this mill must compete upon a parity with other mills.

3. Mr. Carl Barth once said before this body, "Don't try to do the impossible, you can't do it." Now it is impossible for any executive below the rank of the chief executive habitually and automatically to have in mind the genuine welfare of his company unless he is in some way related, unless in some way his interests are secured and allied to those of the Company. For this reason joint research asks that the organization be structurally correct; that is, that each job have one individual responsible for its performance. It is equally important that he be held accountable for that performance, week-in and week-out, until he is convinced that his own interests are only thus secured and related to the Company's.

Now there are of course other requests that it would be easy to put in a prayer at this time. I might add, for instance, that the following requests made of the Union leaders and of the rank and file, *mutatis mutandis*, might well be made of the Company.

What the Joint Research Expects of the Union

1. The first is a study of the needs of the Company. During the latter part of the war I had the great good fortune to know a major in the British intelligence work. He had the single aim of trying to decide what the Germans would be doing one year ahead. There was little co-operation between the two countries at that time, but the British were not above studying their rival. Now under more pleasant forms of struggle the Union should not be above studying the needs of the employers (and *vice versa*). Professor A. D. Sheffield has helped us here. The Union should not be expected to yield its own needs. Co-operation should not mean a chance to get something from the other which he has heretofore refused. The essence of co-operation implies that each co-operator see his own and the other's point of view and then find out to what extent *both* can be substantially met. If that "integration" of interests can be achieved, then the negotiator can go before his constituents with confidence in their approval. For every Union leader is elected. *His* interests are pressing enough in his own mind. Joint research expects the Union leaders to study the real needs and motives of the Company and to look for what statesmen call a "formula," by which they mean a solution, really acceptable and desired by both parties concerned.

2. After the Union members have ascertained that joint research is actually providing that their job standards are ascertained fairly, then the old and indispensable bargaining methods may be dropped. It should be clear to this audience that

without an instrument of relative precision with which to determine fair jobs, it is almost necessary that employes talk and act, to the limit of their skill, as though the job should be less than they may secretly believe. This exhibit of talent is no more to be condemned than the North Wind. But, once convinced that it will not help to set standards, that it will hinder progress and increase delay, it is expected that the Union will discourage this exaggeration and pretense. The same thing is asked of the employer group. There are many items not subject to comparatively exact measurement, but for those on which it is possible, exact measurement will help both parties to a workable and lasting solution.

3. There are of course a large number of employes who have little conception of what we are trying to accomplish. This is necessarily so in a plant of this size. The Union leaders, including the members of the committees and those other operatives who come into contact with our studies, are asked (and it is often no easy task for them) to have the courage of their convictions and defend an unpopular step if they are genuinely sold on its value to the Union. If they are not sold, they are expected to tackle the Technician to get a satisfactory solution. This requires not only courage but also fluency, an unbounded energy and a good grasp of the complicated details with which all situations teem. This is where the two Union members and the research staff are under considerable strain and where the Technician is under the heaviest obligations.

It is a question whether the months are reducing this strain. It is a question whether it can be much reduced until a definite policy regarding lay-offs is worked out. But every step in this vital educational work is important to a solution in which the entire personnel works together like a team. It is of some moment that in mid-November *the entire present list* of Union officers and the Executive Council were renominated. When one hears that in every department and on every important operation rigid tests have been made, one realizes that a phenomenal change in attitude has taken place, that the former traditions are rapidly being discarded, and that the leaders have shown the courage of their convictions in the face of an electorate.

I have finished with the demands that joint research makes of the two main groups. You may believe with me that each of these is worth while for its own sake, or you may not. But I submit that some comparable effort will be required of any similar joint program.

Now what does joint research have to offer?

What Does Joint Research Offer the Company?

You will notice that I am not in general making claims which apply to all research, whether joint or not. I have limited my list to those which are important and striking because they *are* joint.

1. Co-operation is required in setting job standards on an economical basis. Not only are operators informed by joint discussion, but these operators bring out promptly and very willingly the points which the study may not show to be important, or may not show at all.

It is too soon to say that we can make such standards more quickly than research which is not joint. Whether any industrial engineer can do it quicker depends upon what he finds to be done. Of course an autocrat can operate faster than a man with an educational task. But in any textile mill I ask whether that educational task can be ignored with economy. Can you get low end breakage without at least passive support of the Company policies? If we are going to assign the job of setting standards plus what we mean by educational work, then I claim that joint research is quicker as well as more thorough. There are times, of course, when you have to subordinate this educational work or sink; I do not wish to make an extravagant claim applicable to every mill.

It must be made clear that the first sort of aid which the joint feature contributed was in the nature of criticism; and this criticism has been invaluable. Constructive suggestions applying to the operations are of course much more rare. We have been deluged with helpful suggestions as to how to use the joint machinery to the best advantage. I cannot speak too highly of the aid which has come from the Union staff members. They have saved us many mistakes chiefly because of their acquaintance with the Union point of view. (I might add that I *had* no little conceit that I understood the Union point of view better than the average industrial engineer.)

To sum up, this joint machinery of research provides the employes with an urge to take a vigorous part in seeing that no error occurs in setting job standards. Similarly management representatives perform a like service with all the vigor of untrammeled self-interest. I want to emphasize this. I believe that only that machinery which provides for the best interests of the parties concerned, and gains that whole-souled and unhesitating support which we give to our own interests, is valuable. *The key to social reform is always one that each interested party can turn to his own advantage.*

2. In order to set a job standard, certain definite conditions have to be obtained. Many of them boil down to the "end breakage" per unit, as the one condition which must obtain in order that the standard may remain fair. But there are others: What is to be done with dirty roving when detected? What precautions are expected in order to detect it? Exactly how should piece-ups be made in the interests of uniform and strong yarn? What services are to be performed by the section hand, the fixer and others? How are they to be summoned? In each of these cases we hammer out a standard practice which can scarcely be decided on until it represents an economical and practical answer; and then it is *nailed down.* The conditions are recorded and no serious slip can arise, no uneconomical practice which alters those salient conditions creep in, without some prompt and justified complaint. This is worth a great deal to the management. It is true that any sound research requires this same painstaking settlement of what is economical and practical and the same careful record; but such research does not often have the same punch and the same self-righting capacity that it does under our hook-up.

3. As a direct result of this establishment of standard practices, comes a profound improvement in the position of the overseer and in his relations to his help. If an employe does not see fit to follow the standard practice which he has had a hand in setting (assuming he has had a contribution to offer) then that employe is clearly in the wrong. Discipline cases do not normally arise when the employe sees that he is clearly in the wrong. This establishment of standard practices, therefore, restores a form of operation control which has not always obtained where the co-operation between plant and Union has been less detailed. It creates a *"power through"* replacing a *"power over"* that Miss Follett has discussed before this Society. She said that joint discussion seemed somehow to increase power, rather than to take it from either party. Both parties get *more.* If I understand her point, this is a good illustration of it.

4. Finally, there is the advantage that I suppose a psychologist would call "emotional escapes along constructive channels." The capacity to feel and think which exists in every one of us is largely unused in industry. If it is merely dulled, the plant and the neighborhood are fortunate, but it is far more likely to be perverted. What I mean is that the typical worker, in my own experience says, "You don't get any appreciation." He either broods or shows his ability to his associates by his ingenuity in soldiering, and so forth. The typical employer, on the other hand, has his desk piled high with matters which could have been settled more effectively and more promptly "at the point of the job" and which should never have gone to him. This waste of capacity, this employment of "hands" instead of heads, can be greatly reduced by joint research. It not only militates against strikes, but it tends to change the attitude of all from one of obstruction to one of construction, to prevent complaints and reduce turnover, to retain the most self-reliant instead of gradually pushing them into the plants of rivals.

What Joint Research Offers the Union

1. Joint research offers full representation throughout the processes of setting standard jobs. This is a considerable measure of protection against judgments which may be seriously prejudiced. This may be said very briefly and in chilly technical terms. But it means to the wage-earner an increasing protection against inordinate demands upon his or her health; it means an increase in security against having to leave or being fired, because some assignment, due to error, was actually out of reason. Where the old bluff technique obtains, the operative acts exactly as though he were terribly overworked, and when the management is obliged to resort to meeting bluff *with* bluff, this risk of error is greatly increased. Joint research should invariably prevent such cases from arising.

The question of quality standards is similarly relevant. It is often very difficult to lay down standards on quality; but the most difficult part is to get it generally understood that a definite *practical* standard will produce better cloth than a "perfect" standard (which really is no standard at all). Without standards an operator is always open to criticism, which he does not always deserve but cannot well answer.

2. As I have stated, when the job standards and a record of the conditions which obtain are a part of the understanding a reasonable uniformity of the work is secured. If the conditions recorded as standard begin to fall off—if the work gets perceptibly more difficult or irregular—these facts are soon made obvious. An end breakage test or a short study by one of the research staff should make the matter clear, without the delay of a complaint. There is here a protection against suffering from inadequate management. When arrangement regarding jobs is verbal more or less valid complaints are almost unavoidable and are to be found in every department. So are more or less valid replies. There is considerable difficulty in obtaining improvement without understood and recorded conditions—standard practice.

3. I am assured that our joint research has heightened the interest in the Union movement among its members. The meetings are much better attended and they are more interesting. It is whispered that those who represent the Union in joint research are often "taken for a ride," but I notice that they usually come back from the Union meetings encouraged and feeling that the many evenings they are devoting to this work are worth while.

4. Joint research offers ingenious and ambitious employes a splendid opportunity to show their value as budding inventors, as clear thinkers and as spokesmen. Where specialization is introduced a number of possibilities at once arise for using implements which would not pay when every operative has many incidental operations to perform. But these physical problems are less important than those relating to our work. How can we best measure this effort or that; how *regularize* it; how avoid this objection or that; how can the joint machinery best cope with some persistent problem? I often think that the main job of the industrial engineer is to liberate the ability which has somehow been lost because of our misconception of the nature of organization. I am convinced that the unions through the breadth of this land are fighting this same battle, often unconsciously; and further, that the greatest waste in industry is the waste of this constructive spirit which is just beginning to be tapped by means of joint research.

Discussion

By FRANCES PERKINS

Industrial Commissioner, State of New York

EVERYTHING I read today I read from the point of view of how it may be made to affect industry in the State of New York, which, after all, is my prime responsibility. As I understand this Naumkeag experiment, it is an experiment made in a particular locality in a particular industry with a selected personnel. Out of it has been demonstrated a very real truth for that particular situation. If it is true generally as well as specially, it is of tremendous importance to all of us who are engaged primarily in trying to create an industrial civilization.

The Industrial Commissioner of the State of New York would be quite unequal to the task of making a yard of cotton cloth, assembling a machine or even making any simple article which is ordinarily in commercial use. Yet we are all engaged in this industrial enterprise; those of us who have any interest in industry are engaged, it seems to me, in a great philosophical enterprise, an effort to create out of a society which is frankly industrial, a civilized society. Can we have an industrial society which is also a civilized society? This is why we are all interested in such a vital experiment as this, because it seems to bear on the face of it, for that locality, at least the germ of civilized industrial life.

All of us have heard for the last twenty years the wailing of those who regret the passing of the day of the hand artisan, the wailing of those who say, "How beautiful it was in the day when the potter took the clay and formed it, and had an artistic as well as a materialistic expression when he made the bowl." That was, I think, an industrial civilization that we all realize; it was a civilized society as well as an industrial society where the artisan and the craftsman controlled life and had a social and political life which arose out of his activity. I have always believed that the time would come in our modern industrial state when we also would have a period in which the activities of the people and the life of the people would reflect their relationship to their work. It is possible that in this Naumkeag experiment we have the beginnings of a civilization in which people's activities, people's social life, people's political life, as well as people's industrial life, are based upon a conception of human happiness.

One of the things that interests me about this experiment, philosophically speaking, is that it has developed and come to such success as it has during a period when the industry in which the experiment was made is in the contracting phase of the business cycle, as Professor Wesley Mitchell calls it; when the industry in general, throughout the country, is on the decline; when we have had in that particular industry a thing which Professor Simon Patton used to call a deficit situation. He was always interested in pointing out to his classes in the old Wharton School that we got the flower of our civilization, of artistic achievement, during the surplus periods. During the deficit periods of civilization he said we got a tremendous impetus to ingenuity and to organization.

It is interesting to me that this experiment has grown up in an industry which was at the time of its development on the deficit side of its life. If it is true, as Professor Wesley Mitchell, who is one of our most competent economic observers, seems to think, that we are now passing into an industrial period which is on the deficit or contracting side, perhaps within the next twenty-five years we shall see the same ingenuity and a similar type of organization generally develop out of this deficit in all industry.

Another thing that has interested me considerably about this experiment is that it offers a pattern which may be used by other industries for other purposes. You had in mind a particular problem; you had a particular set of questions to which you had to find answers if the industry was to survive. Other industries have other problems which they must solve. We in the Department of Labor are constantly concerned with this problem in all industries: How can your industry so organize itself as to prevent the constantly increasing number of industrial accidents, which are not only fearful things in cost for industry but are fearful things in the losses which they inflict, both economically and humanly, upon society. Could not this relationship between employers and employes be used and developed for the prevention of industrial accidents? As I see it, workers are generally not concerned with the prevention of industrial accidents on the economic side. They are only concerned with the accident if it affects them individually. In other words, they remain individualists instead of becoming a part of the social organization of the factory. Therefore, the cost of the industrial accident, its economic importance, has little meaning for the worker. If the industrial accident had an economic and social, as well as an individual, meaning for him, it is just possible that out of that relationship we should get the beginnings of a safety movement which would be truly successful.

You probably are entirely familiar with the state figures which show almost universally that industrial accidents which spring from personal carelessness, that is, the accidents which we roughly classify as the slip, fall and stumble accidents, appear to be increasing, whereas the accidents due to machinery itself appear to be decreasing. In other words, insofar as mechanical devices could be set up to prevent industrial accidents, there appears to have been a definite improvement over the last twenty-five years, whereas there is no improvement, and perhaps a positive increase, in the other type of accident. If we are to handle that problem, which is a human problem, with any success, it has got to be by some kind of co-operative relationship between management and workers.

It is very important in this unemployment insurance which you are attempting to work out at Naumkeag that you realize, as has every industry which has attempted to work out a scheme of unemployment or lay-off insurance, that there will necessarily be very considerable changes in the method of planning the production and the sales of the plant. It is extremely significant that the workers at Naumkeag are involved in this planning of sales and production.

For labor to become significantly involved in planning the economic and financial side of any industry, to become an important influence upon its planning for production and sales, I feel would mean a much greater victory both for labor and for the future of human happiness in America than any number of successful strikes for immediate shorter hours or higher wages. That is because labor would be bound in the end, if it is true to the mission which it has assumed, and I believe it still is, to use its influence in planning both production and sales and in the development of the industry to preserve those human values which are the essence of the meaning of civilization.

I hope that in this pattern we are going to have a number of other experiments made in other industries. Then very gradually and very slowly we may evolve a new type of industrial civilization.

Another significant thing about this experiment, and one which ought to be thought of if any similar experiments are to be tried in any part of the country, is that here there appears to be an organization, susceptible of use for many purposes, in which the organization itself and the relationships between employer and employe spring naturally out of the work, out of the process and out of the method. This idea of the value and importance of the integration of the type of organization for human activity with the type of organization for production is an idea which Robert Bruère pointed out to me a number of years ago and which I have been brooding over ever since. It must be at the very bottom of all activities scientifically planned for the improvement of an industrial society. For instance, most of us have had a queer feeling about welfare work in factories, however good it may be to have health examinations, clinics and nurses, however good it may be to have schools for the teaching of English and other cultural or vocational subjects in connection with factories because they are convenient places. We have all felt a kind of shrinking away from that sort of activity, from that sort of good action which was laid on an industry without spontaneous relations, without springing naturally from the people involved. At Naumkeag a pattern seems to have been formed in which the co-operative organization is integrated with the organization necessary for the production of cotton sheeting, and that is why it is essentially a sound and scientific pattern for use in other industries.

I have a great hope and a great belief that the next ten years are going to see the sharpening of a sense of organization in industry, a development of a willingness on the part of the American people to think of themselves as having a real life, a full life, a complete life, in their jobs, in the places where they work, and in connection with the industries in which they serve the community.

If people could once become as interested in the entire industry as the old shoemaker used to be in the shoes which he made for his friends and neighbors, we should have a truly civilized society. For the most part, in the development of a machine and scientifically managed industrial life we have management having all the fun and the worker having nothing but the drudgery. As you all know, monotonous work is pure drudgery if there is no conception of the meaning back of it. Scientific managers have had a great time and a lot of fun in the last ten or fifteen years, but I think that the working people of this country have not begun to share in that fun which comes from a sense of having a great and powerful system under control. If the workers come to share in that, we shall have not only civilization but a happy industrial civilization.

ONE of the most common statements of writers more impassioned than veracious is that the methods of American industry are "brutalizing" the working population. To what extent does this statement express the truth?

To this question, as to many others, it is not possible to give an answer except by examining actual American life. Strangely enough, America is perhaps the last country where the effect of mechanization on the working population should be studied. For I insist that such a study can be of value only in case the subjects studied are subjected to a system under which their mental or physical condition can be attributed unhesitatingly to their living conditions . . . . how can we essay any conclusions regarding the American people without danger of straying immediately into the most questionable assertions?

If a visitor, recently impressed by reading of the monotony of Taylorized work, should go through a factory, he would be immediately tempted to establish a relation of cause and effect between the work to be observed and the degree of intelligence reflected in the appearance of the workers. But if a worker who has arrived completely illiterate only two years before from the plains of the Ukraine should look rather bewildered in an American factory, one ought not to hasten to attribute his appearance to the influence of the machinery surrounding him, even though certainly it may contribute but little to the development of his mind. (H. Dubreuil, *Robots or Men?* pp. 225-226.)

Distribution Problems

Is It Good Management Policy to Assume That Consumer Wants for Particular Goods Are Insatiable?[1]

By PAUL H. NYSTROM
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THE SUBJECT assigned to me is a question, "Is it good management policy to assume that consumer wants for particular goods are insatiable?" The answer is most emphatically "No!" It is difficult to believe that anyone in these days might have an opposite view.

For many years economists have taught that consumers' wants are without limits but this statement has rarely, if ever, been interpreted as meaning that consumers' wants for particular goods are insatiable. Economists have had *general* rather than *particular* consumer demand in view. They have merely called attention to a fact of common knowledge that when certain consumer wants are satisfied others arise. As these are satisfied still others arise and so on indefinitely. The economists' concept of limitless human desire is a very different subject from the one proposed in the title of this paper.

The suggestion that consumer wants for particular goods are insatiable is contrary to ordinary common sense and every-day observation. Consider your own households. Are the wants of the members of your household insatiable? Are there no definite limits to the amount of food desired? Is there any particularly desirable item for which there exists no point of satiety? Are there no limits to the wants for clothing? For fuel and light? For furnishings and other commodities? If your wants and those of your immediate household are limited for any specific commodity, then is it not reasonable to assume that consumer demand generally, which is but a composite of individual wants, is definitely limited for every particular kind of goods made?

Obvious as it may be that consumers' wants as applied to particular commodities are quite definitely limited, there appears to be a recurring idea among many business executives, particularly among sales and advertising heads and occasionally among production heads, that sales effort can be applied increasingly, indefinitely and profitably without regard to the limits of consumption. Sales policies and sales plans are frequently outlined with unbounded enthusiasm and imagination apparently unhampered either by facts or by experience. High pressure sales methods are devised to carry over such programs of distribution and sales. If any of them ever succeeded we would learn something new from them, something as important as it would be if discoveries were made on how to overcome gravitation or on how to transmute metals on a commercial scale. That most of such sales campaigns intended to increase sales beyond practical limitations fail apparently does not deter those who come after from making the same mistakes again and again.

The faith that there is an unlimited market for any commodity is apparently as widespread as the belief in Santa Claus and is certainly as fruitless of practical effects as the faith in witches and fairies.

It should be admitted at the outset that the facts of practical experience are often incomplete and inadequate as indications of actual possibilities. Because a certain result has never before been accomplished is, of course, no reason why it may not be accomplished in the future. History is full of illustrations of this truth. A change in product, in quality, in quantity, or style, a change in its price, a change in its selling methods, or a change in consumers' desires may easily result in opening up extensive new markets. Experimentation with the trends of consumer demand is everywhere and with all classes of goods continuously necessary.

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[1] Paper presented before a meeting of the Taylor Society, New York, December 6, 1929.

Such readaptations and changes do not alter the truth that the demand for a given commodity is always and everywhere limited. The change in demand in such cases is a result of the change in conditions. But such changes are as likely to have adverse as favorable effects on the extent of demand.

As an illustration of the contraction of consumer wants due to a change in business conditions, take the example of an automobile salesman who back in the period from 1917 to 1920 was known to the automobile trades as the most expert and successful automobile salesman in Greater New York. His operations were carried on in the Bronx. His ability was so great and so well known that business men commonly said that whenever this man set out to sell a car he always came back with a signed order. His sales records were nothing short of marvelous in comparison with other motor car salesmen of that time.

Then came the business depression of 1920 and 1921. This man with his wonderful sales ability, in common with all other salesmen of that time, slumped badly. Despite his most energetic and most carefully planned efforts, this star salesman did not sell a single automobile for nearly nine months.

His prospects who had formerly been easy to land had, for the time being, become very difficult to sell. Their wants for automobiles had declined precipitously. The reasons for the change in consumer demand in this case were obvious. Purchasing power had been greatly impaired. Even beyond the declines in purchasing power consumers held off in fear that the business depression might become even worse.

Such cases of abrupt changes in business conditions and consequent changes in consumer demand must be known to all of you. Luckily consumer wants do not always drop out completely as they apparently did in this automobile salesman's territory. There are, obviously, changes in business conditions going on all of the time which tend either to increase consumer wants or to cut them down, and the best laid plans of sales promotion can scarcely accomplish more than to ride with the rising and falling waves that occur in consumer demand.

It may be asserted, therefore, that there are definite limits in consumer wants for particular goods and as all consumer demand resolves itself finally into particular demands, it may also be asserted that there are definite limits in consumer wants for every class of goods. The neglect of this general fact by industrial and mercantile concerns leads to wreckage and business loss which are inexcusable. A business organized and operating on plans intended to secure a volume beyond the limits of possible consumer demand is foredoomed to failure and loss.

Consumers' wants for all classes of goods are definitely modified and limited by several factors among which may be mentioned *purchasing power, physical limits of consumption, changing living conditions, the competition of other goods serving the same purposes or even different purposes, and changing consumer tastes.*

1. *Limits on Consumer Demand Set by Purchasing Power.* We have, during recent years, been impressed on every hand with the economic progress made in this country. This is indeed a wealthy country. Its people enjoy a greater income than any other of the world. Its annual national income, said to be in excess of ninety billion dollars, is not only the greatest in any nation but the greatest in the history of our own nation. This enormous national income is distributed to nearly thirty million families. The average, that is the mathematical average, per family, is about $3,000 a year. What indeed cannot be effected by distribution and sale of consumer commodities to this great market Such is the picture presented for our admiration and as a basis for business building.

We may truly marvel at the economic progress made in this country, but our appreciation of the improvements in purchasing power and of American standards of living should not influence us to over speculation and over valuations. Recent lessons from the stock market seem to indicate that such considerations should come before rather than after the plans are started and investments made.

In the first place the average income of $3,000 a year per family is meaningless except as an index. Every analysis of actual distribution of income shows that a small proportion of the total number of families have incomes ranging up into the multithousands, while the masses of the people have incomes considerably below this average. Probably fully half of the families within the United States have incomes well under $2,000 a year. Even if they were $3,000, or $5,000, or $10,000, consumer wants would be limited by these amounts, but at $2,000 or less per family per year they are still more limited. In our speculation on what the limits of consumers' wants might be for any particular commodity it is clear that for most goods we reach those limits much more quickly if half or more of the people of the country live on incomes of less than $2,000 a year instead of $3,000 per year.

There is a multitude of demands made upon family incomes. There are the requirements for food, for clothing, for shelter, for home furnishings, for education, for amusements, for health maintenance, for travel, for taxes and many other items. Finally there must be savings. Some portion of each family income must be contributed to each of these requirements.

Studies made of family expenditures have always indicated a certain degree of regularity in the distribution of family income for various purposes. Thus, while the average income may be $2,000 per year the industry producing a given commodity, such as an article of food or of wearing apparel, cannot hope for a general participation in the total income but must confine itself to efforts to share in that part expended for the class of goods in which this particular commodity falls. The sales of a breakfast food do not share directly in the distribution of the total family income but solely in that part of the family income expended for food and even more specifically only in that portion of food expenditures made by American families for cereals and cereal food products. Out of the ninety billion dollar total national income food expenditures probably do not exceed twenty-two billions of dollars of which cereal foodstuffs of all kinds, including not only breakfast foods but flour, bread, cake, crackers and so forth, amount to not more than four billions of dollars. The breakfast food manufacturer thus enters the competitive food markets fairly definitely limited in total expenditures to about 4 per cent of the national income and probably about 4 per cent or 5 per cent of the average family income. Considering the food habits of the people and the importance of competitive cereal products, such as bread, crackers and rice, the actual net market opportunity for the breakfast food manufacturer comes down to less than 1 per cent of the average income possessed by a family.

Theoretically it may seem possible to capture some portion of the amounts expended by the public for other types of commodities if the proper methods of selling promotion are used. Undoubtedly this does sometimes occur. Perhaps the general demand for and purchases of automobiles have had the effect of cutting purchases for furniture, clothing, shoes, jewelry and even food. At least so many business men think. I do not know of any decisive proof of the point, but it may be safe to assume its accuracy. Practically, the difficulties of increasing the family purchases of certain commodities at the expense of other classes of goods are very great. If the individual family, which after all is the unit of which the entire consuming public is made up, spends too much for shoes it means that other wants will be deprived of satisfaction. Most people cannot buy more clothing and pass up the payment of rent and dentist's bills. Some rough sort of balance of the various necessities of life must be preserved.

Changes in purchasing power, of course, make important changes in the actual expenditures for every group of commodities. These changes affect consumption both as to amounts desired and prices paid. As purchasing power rises or declines regular sequences occur in the consumption of all classes of goods. These effects of changes in purchasing power are so systematic and so regular as to merit description by principle or law. Ernst Engel, of Prussia, formulated a statement of these changes in consumer wants nearly seventy-five years ago. Much progress has been made since in the correction and modification of these laws.

2. *Physical Limits of Consumption.* That consumers' wants have physical limitations is most clearly evident in the consumption of food products. The size of the human stomach and the food requirements of the body are the ultimate limits. It is true that among people below the poverty line there may be food inadequate in quantity as well as in quality so that as incomes rise the quantity of food consumed also increases, but for families in moderate or better financial circumstances the limits of quantities of foods consumed are definitely reached. As incomes increase and standards of living rise, it is noteworthy that consumer demand changes by requiring greater varieties of

foods and more expensive foods but not greater quantities. In fact as incomes increase the demand for certain foods definitely declines because they are replaced by other items of diet.

The best advertising and sales promotion in the world cannot sell a man another meal just after he has had one, nor can the best sales promotion increase the consumption of bread or of fruits or of meats appreciably except at the loss of sale of other food products. Sales promotion, even when most effective in the field of food distribution, probably does not increase the total quantity of food consumption whatever. It merely centers consumer demand on specific commodities or specific brands and attempts to exclude or cut consumption of brands made by other manufacturers operating in the field.

The physical limits of consumers' wants are not so clearly defined for clothing, shelter, fuel and light and other commodities, but that there are limits can scarcely be doubted. Most men have fairly definite ideas of the number of suits of clothes and the number of pairs of shoes that they should have at any given time. It is true that these views differ from individual to individual. Probably such differences are due to differences in standards of living based on differences in income, in type of family life, in education, in social pressure and so on, but whatever differences there may be among individuals, the difficulties of selling any given individual more suits of clothes and more pairs of shoes after the requisite number to supply the individual's present standard of living has been acquired must be very great. Inducements to add to the wardrobe must either involve a change in the standard of living with all that this involves in the entire round of expenditures or there must be special concessions to induce the customer to buy and hold the additional goods for future use.

3. *Changing Living Conditions.* Consumer wants do change. Whether these changes are caused by fundamental factors, such as changes in income, changes in size of family, changes in education and social pressure, or as a result of sales promotion, constitutes an interesting subject for discussion which cannot be taken up here. Whatever their causes, obviously, changes are occurring in methods of living which in turn are reflected in great changes in consumers' wants. Some of the most outstanding current changes in living conditions are the diminishing size of the home, the decline of household industries and activities, the increasing tendency to rent rather than to own homes, and the growing patronage not only of laundries, bakeries and delicatessens but also of restaurants.

Each of these changes results in definite changes in consumers' wants. For example, the demand for foods which require much labor, time and skill in preparation at home is obviously declining. The demand for foods which may be easily prepared, requiring little time and labor, is clearly increasing. The changing character of the grocery store and of the food manufacturers who supply the grocery store furnishes striking evidence on this point. The old-time butcher shops dealing in roasts and other heavy meats requiring boiling, stewing or baking are declining. The delicatessens with their ready-to-serve foods are increasing. In fact there are those who believe that the old-fashioned meat market and, indeed, the grocery store, as such, will within a few years pass out and give way to a new type of food store largely specializing in the sale of ready-to-serve foods.

Within the home these changes are reflected in a declining use of the kitchen, declining demand for kitchen utensils, and in declining sizes of kitchens. There are students of changes in living conditions who freely predict that the private home dining room may pass out almost entirely within the coming generation.

Obviously the effects of these revolutionary changes which we are here sketching so briefly must seriously affect and limit consumers' wants for all sorts of house and home furnishings. It is certain that the kitchen and the dining room of the home of tomorrow will be very different from the old-time kitchen and dining room of our parents or the arrangements that pass for kitchen and dining room in our present apartments and houses. Certainly consumers' wants for the goods that are used in the home are definitely limited by these changes in living conditions.

4. *Competition of Other Goods.* Sales promotion methods might in many cases and in many lines successfully change consumer demand both for quantity and kinds of goods by causing consumers to turn from the consumption of certain goods to others. The difficulty about this suggestion for present day practice is that all types of commodities intended for consumption are pressed forward with

almost equal intensity upon the consumers' attention. Probably, if there were no opposition, the manufacturers and retailers of shoes could through intensive sales promotion efforts induce the consumers of the country to purchase more shoes, but, as has been seen, such increases in purchases of shoes would be at the loss of purchases in other lines, possibly clothing, food, home furnishings, amusements or automobiles. Certainly these industries cannot be expected to sit idly by and watch the shoe industry add to its sales beyond normal or usual proportions without taking aggressive action in return. The actual or potential competition of industries for consumer demand tends to keep all alert. As a consequence the consumer is bombarded by suggestions to buy on every hand with the result that much of this bombardment of sales promotion must merely result in cancellation of sales effort and a net consumption not affected or changed at all by this promotion.

Sales promotion in all of its forms is an effective agent of business. Properly handled it gets business. In certain phases it serves a highly useful social purpose as well. It shows consumers new ways of securing satisfaction. It cannot be denied, however, that much of advertising, particularly that which is purely competitive, seeking to take business away from other concerns, is socially wasteful. Certainly the results of such sales promotion, as measured by actual increases in consumer wants, are not proportional to the efforts expended.

5. *Changing Consumer Tastes.* Back in the fall of 1922 there arose a powerful demand among the women customers of American department stores for beaded dresses. Bead work involves hand production, and since labor is cheaper in Europe, beaded fabrics and garments, when in popular demand, are usually imported from Europe.

During the first season of this particular consumer movement the retail stores had not nearly enough beaded dresses to supply the demand. In preparation for the second year these stores increased their import orders greatly, but consumer demand proved even stronger and these garments were all successfully sold out. For the third year the stores made even greater preparations for the sale of beaded dresses. The demand during the fall of 1924 started out fairly well, but before the end of the season apparently no one wanted these beaded dresses. It then developed that there were great stocks of beaded dresses everywhere and no consumer demand for them. Many stores suffered great losses in mark-downs before they finally got rid of them. A change in consumer demand had taken place which involved a change in taste. No form of sales promotion was effective in bringing back a demand which had petered out.

Back in 1923 a retailer of my acquaintance out in New Jersey acquired a shoe store and found that it contained a big stock of good quality shoes, of a well-known brand, but they were high shoes. He resolved to clear them out but found it impossible to attract customers for these shoes even at half prices and there was considerable difficulty in getting rid of them even at $1.00 a pair. Consumers in that New Jersey town didn't want high shoes. Obviously, consumers are interested only in current fashions. Goods of a style no longer in use, even when of the best qualities in other respects, are not wanted at any price.

Wouldn't the manufacturers of millinery trimmings, such as flowers, feathers, ribbons, metallic ornaments and so on, like to find a way of developing consumer demand for these goods! What about the satiability of consumers' wants for such particular goods?

What has become of the slave bracelets and the Chanel necklaces of a year ago? Of the Deauville scarfs of three years ago? Of Mah Jong, of Kewpies and of teddy bears of six or seven years ago? We are not talking about the crinoline, the bustle and the horse carriages of past generations. We are talking about recent changes in taste. These changes are going on continuously. They affect not only apparel, jewelry, hair dressing, millinery and shoes, but also practically everything that goes into the home, everything that consumers use.

What has become of the rage for bungalow construction that dominated domestic architecture a dozen or fifteen years ago? What have become of the golden oak, mission and craftsmen styles of furniture? What has become of the old chandelier lamps and even of the floor lamps of 1920, with their brilliant silk and fringe shades? Obviously, consumers' tastes have changed and with each change new limits in consumers' wants have come into existence.

Changing tastes, that is changing fashions, are forces in consumer demand that must be reckoned with. Business tragedy awaits the business that disregards fashion. One type of error common to business is to neglect these changes, to be behind the procession, to fail to cash in on consumer demand at its height. Another type of error, probably equally wasteful, is to plunge ahead of the trends and to try to force the changes more quickly than they normally occur.

A good illustration of the latter error has apparently occurred to some extent in the women's apparel industries during the past six months. A concerted effort in which dressmakers, manufacturers and retailers have participated to bring about a new fashion involving a radical change; perhaps a too rapid change, in silhouette has undoubtedly been pushed too hard, with the result that harm rather than good has been perpetrated on the entire industry.

It is still too early to form definite conclusions about the past season's apparel business. Published reports are conflicting. Many stores have suffered declines in apparel sales. Others have held their own. Still others have shown increases over the same period for last year.

The October report of the Federal Reserve Board indicates large increases in sales of misses' dresses, a very moderate increase in women's dresses and little or no increase in coats. The Credit Clearing House in New York reports that shipments of women's and misses' apparel from New York manufacturers and wholesalers during the past season have been about the same as last year. In a survey of the dress industry made by the Associated Dress Industries, Inc., and presented in a report in President Hoover's conferences with heads of industries, more than half of the manufacturers reported current business as only fair. Employment in the women's apparel industries for the season ending October 31 has been about the same as, or somewhat less than, last year. Where separate store reports have been available it appears that sales in women's specialty shops have been rather poorer than in the apparel departments of the department stores.

Instead of garment sales mounting very much higher as it was believed would happen from the introduction of the new fashions, it now appears that the sales in women's apparel are likely to show no important gains, and may indeed be lower for the country as a whole, this year than they were last year. In many, if not most stores, it has been found that sales resistance, particularly in women's dress departments, and especially coat departments, has materially increased. Customers have become undecided and confused and many have, it seems, postponed their regular purchases. It has required from two to three times as much time and energy to sell a garment in the new style as it did last year. The season just passing has been a very trying one for garment sales people as well as for their employers. Several stores report an increase in returns and in alterations.

Altogether it seems certain that in many stores the net results of this promotion, particularly of the ultra long skirts, has resulted in a decline in sales and an increase in the expenses of selling. The moral to be drawn from this experience, if it may be called a moral, is that it does not pay to try to force changes in fashion more rapidly than consumers want them changed. A slower and more gradual change in the styles offered to the public, more naturally promoted, would probably have avoided these losses.

Whether this analysis of the present women's apparel situation is correct or not, the principle involved is clear. It is as dangerous to be ahead of fashion as it is to be behind it. There are definite limitations in consumers' wants beyond which sales promotion is unprofitable.

In conclusion, instead of assuming that consumers' wants are insatiable, it is here urged that good management policy should assume that consumers' wants are definitely limited, as indicated in these illustrations. Changes in a product, in its quality, its quantity, its dimensions, its price, or new discoveries as to its uses or applications may change the extent of its market by changing its possibilities for consumers. Given fixed conditions in these respects, there appear to be definite limits in consumers' wants for all classes of particular goods determined by such factors as limits in purchasing power, limits in use, changing living conditions affecting both purchasing power and use, competition of other goods and changing tastes or fashions.

Do Consolidations Result in Reduction of Distribution Expenses?[2]

By **B. C. MILNER, Jr.**
Ford, Bacon & Davis, Incorporated, New York

IT IS impossible for me to conceive of any question which is more difficult to answer than that which I have recently been asked to discuss. "Do consolidations result in reduction of distribution expenses?" The man who can think of a query which is so complicated and so all inclusive has my sincere admiration, and I am convinced that the attempt to answer it has been a contributing factor in the illness of our Vice President, Mr. Judson. A complete answer would require not a mere paper such as I have been asked to prepare, but a whole library.

Unquestionably this is the most important problem facing American business men today. Consolidations during the first twenty years of this century were almost invariably based upon effecting economies in production. To a very large extent the possibility of effecting major savings in the cost of goods has been eliminated by the work which has already been done. It goes without saying that further ways of decreasing costs of production are being and will be developed, and I sincerely trust that this process will never cease. However, it must be recognized that, speaking in general terms, further savings in the costs of production will be in terms of fractions of per cent, or in pennies per unit.

Again, speaking in general, we may say that the substantial profits of the past have been earned by the companies who first learned how to produce more cheaply than their competitors. The profits of the future will go to the companies who learn how to distribute with greatest economy.

At this point it might be well for me to state frankly that I do not believe any one man can give a comprehensive and conclusive answer. There are numerous consolidations, with which you are all familiar, which have been eminently successful. Almost every detail of the formation and subsequent operation of these mergers has been given to the public through our newspapers and magazines. We reached a point a few short months ago where we seemed to feel that there was some form of magic relating to the very word "merger," and our faith in the infallibility of this process is attested by the hundreds of millions of dollars which were placed at the disposal of those who, reversing the biblical injunction, were engaged in the process of making one company grow where two or more companies grew before.

Fortunately, or unfortunately, developments of the past forty-five days have brought very forcibly to our attention the fact that we have numerous mergers and consolidations which have received very little publicity, and which are not, and probably never will be, really successful.

Within the past few weeks we have read and heard many explanations for the crash in security prices on the Stock Exchange of the United States. Somewhere among these I read an article, in which paper and by whom I have forgotten, to the general effect that part of our ills were due to the fact that many consolidations had been effected solely because there was a "finder's commission" to the promoter, and a handsome profit to the banker who floated the securities.

It is a very simple matter to take the balance sheets and operating statements of two or more companies and to set down their figures in parallel columns. Working out estimates as to what might happen if these companies were consolidated has a distinct fascination. The process that is ordinarily followed includes an estimated increase in sales, an estimated saving in cost of sales, an estimated decrease in selling expenses and in administrative expenses, and consequently the estimated future operating profit is enormously increased.

Following the same process the balance sheet figures are totaled and then these totals changed to allow for amounts by which fixed investments can be decreased, inventories lowered, cash balances increased, fixed charges reduced, and so on.

In theory all of the estimates are correct, and the resultant figures are usually highly satisfactory from every angle. Theoretically, if two competing companies are consolidated sales should increase.

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[2] Paper presented at a meeting of the Taylor Society, New York, December 6, 1929.

It would seem that eliminating the competition between two selling organizations and concentrating the efforts of those organizations under one executive should result in increasing sales both by obtaining a larger share of the existing business, and by increasing the market. Similarly, the consolidation of production facilities and the elimination of the least efficient plants should make it possible to decrease direct costs and to scale down overheads. In theory at least both sales and administrative expenses should be decreased following a consolidation. Only one set of officers will be required, only one sales manager will be necessary; one production manager can be eliminated, and so on.

Again in theory, where two or more companies are merged it should be possible to carry on the combined businesses with less plant and machinery, with less inventory, with smaller fixed charges, and as a consequence of all of these things the net profits available for dividends should be tremendously increased.

It is very unfortunate that actual results obtained by consolidations do not always work out according to the estimates, and the fundamental reason for this is that no one has devised any method of estimating future results of the most important element in any consolidation—the human beings who are to be picked out of their separate organizations and thrown together, without their advice or consent, to work under circumstances which may or may not be pleasant, with new associates whom they may or may not like, and at tasks for which they may or may not be prepared.

Any of us can take two factories and place them under common ownership with full assurance that we will have so many square feet of floor space, so many machines and other facilities. Any one of us can take two bank balances and add them together with full assurance that the result will be a given number of dollars; but no formula has been devised whereby we can put together two presidents, or two sales managers, or two stenographers, or two workmen, with any assurance that the net result will be even one competent executive, or one aggressive merchandiser or one satisfactory secretary, or one efficient producer.

It is because of this essential human element that many consolidations fail to measure up to the estimates prepared by promoters. It is an unfortunate fact that most mergers which have been effected have entirely disregarded the persons who are to operate and manage the combination. The general feeling seems to be that if terms and conditions as to securities can be agreed upon, and the president of one company made chairman of the board, while the president of the other company becomes president of the consolidation, that no further thought need be given to the matter.

You are probably all familiar with the statistics regarding mergers prepared by Professor Arthur Stone Dewing of Harvard University. Out of thirty-five major industrial consolidations effected between 1893 and 1902, in only three instances were the actual earnings for the first year equal to the estimated earnings; in only thirteen cases were the earnings the first year for the consolidation equivalent to the earnings of the separate companies prior to the merger, and in only fourteen cases were the earnings in the tenth year after consolidation equal to the earnings of the separate companies. It is my belief that if the same information were available on all mergers which have been effected in this country to date that very much the same situation would be revealed.

The engineering work of Ford, Bacon & Davis, Incorporated, has brought us into intimate relationship with numerous public utility and industrial consolidations during the past thirty-five years. Our work is of a type and character which make it essential that we should procure an intimate knowledge of operations of these companies. This has enabled us to obtain a detailed cross section of American business, which is not usually available. It might, therefore, be of interest to cite some of the specific situations which we have seen develop, or which we have been in position to watch in subsequent periods. I will not go into the public utility consolidations, because of my understanding that the question raised was not intended to cover this field. I might say in passing, however, that the reduction which has been effected in the cost of distributing transportation, electricity, gas, water or other public utilities is negligible as compared with the reduction which these consolidations have effected in the cost of producing the service.

My personal experience has been confined to industrial operations, and as my experience with consolidations has been limited to companies manufacturing finished or semi-finished products, I should prefer at this point to narrow the subject under discussion by adding the words "of manufacturing companies" to the original question.

You will understand that our relationship with our clients is on an absolutely confidential basis and it is, therefore, necessary in instances which will be cited hereafter that all facts should be so disguised that the specific company in question cannot be recognized. Company "A" was a medium-sized manufacturer of an integral part of automotive vehicles. The company had grown at an astonishing rate from a very small beginning and it reached a position of pre-eminence in its particular field. The president of the company was a man of unbounded energy, enthusiasm and a wonderful personality. He had started as an apprentice in a machine shop and his ability as an economical producer was unquestioned. He had, also, a special ability for picking, training and controlling production men. Merchandising, however, was a closed book as far as he was concerned and unfortunately he did not exercise the same keen discretion in choosing his sales organization as was so evident in the building of his production division.

The company continued to grow in spite of, rather than because of, its selling organization. A promoter suggested that the company absorb two other companies manufacturing non-competing products, also applicable to the motor car industry. Based on past records and estimated future earnings the consolidation was readily financed. The important element in the estimated increased earnings to be effected by the consolidation was the sale of the products of the three companies by one group of salesmen and the elimination of two sets of sales executives, branch offices, billing clerks, collection departments, and so forth. Further substantial savings were to be effected by consolidating shipments from three plants in carload lots.

The three companies separately had earned in excess of two million dollars net in the year prior to the consolidation. Within three years after the consolidation, the company went into receivership. The cost of distributing the products of this consolidation actually showed an increase while the net sales showed a considerable decrease. As soon as the consolidation was effected, the general sales manager of the major company was given charge of all merchandising activities, with instructions that the best men in each organization were to be retained. Dissension developed immediately, accompanied by a feeling of uncertainty on the part of each member of the sales organization as to whether he was to be retained or discharged. Obviously very little effective sales work was done, for each man was primarily engaged in attempting to protect his own position and at the same time keep an eye out for other employment. By the time the final decision had been reached as to the eventual make-up of the consolidated selling force, it was ascertained that selling expenses had not been decreased to any material extent. Salary raises, based upon the assumed increase in responsibilities, had become rather general. In consolidating branch offices more expensive quarters were acquired so that branch rents for the consolidation were almost equal to the rentals paid by the three separate companies; traveling and entertainment expenses showed an astonishing increase and calls per salesman decreased by over 50 per cent. The excuse was that each salesman now had to discuss three products and usually had to see three different men in each automobile plant with the consequent delays in going from one man to another or from one department to another. Numerous accounts were lost for each product as the automobile manufacturers were absolutely unwilling to entrust to any one organization orders for three essential parts of their completed cars or trucks.

Some years later, "B" company in an entirely different field undertook a program of expansion. Careful consideration was given to all conditions prevailing in the particular industry in which this company was engaged and the decision was reached that expansion by consolidation should be effected, but that such consolidation should be with non-competing companies manufacturing products saleable in the same general market. The first step was a major merger, carefully worked out, not only with the stockholders of the respective companies but with the operating personnel including the minor executives and department heads. No attempt was made to eliminate any existing selling expense other than the duplication of branch offices. Branches were opened in numerous cities which neither of the separate companies had been able to afford. Therefore, where offices were consolidated one manager and some of the other employes were moved to new cities, retaining both titles and salaries. The sales staff was not only maintained but was increased by the addition of salesmen to cover the newly opened territories. Each salesman continued to concentrate on the product with which he was best acquainted, but of course boosted all the products of his company, and exchanged information with his fellow salesmen as to prospective customers for the allied line.

After an eighteen months' interval, spent in working out the consolidation of the two organizations, building a real *esprit de corps,* a third company, manufacturing a different line of products, was brought into the consolidation and similar methods were followed. A year later a fourth company was added. The net result has been an actual increase in sales of approximately 33 per cent over the sales of the separate companies, a decrease of administration expenses equal to 3 per cent of net sales, a decrease in selling expense of approximately 4 per cent and an increase in net profits of almost 250 per cent. Everyone concerned has benefited, the consumer by receiving improved products, and better service at lower prices, the employes by increased earnings, and steadier work, and the stockholders by increased dividends.

In this particular case the answer to our question would obviously be an enthusiastic affirmative.

The results of the foregoing case were so entirely favorable that a promoter was able to interest a group of bankers in financing an even larger merger in the same industry, and the operation was carried out, not step by step, but simultaneously. Ten companies were merged at one time. The first word that the employes of any of these companies had was the appearance in their local paper of an Associated Press dispatch from New York that the consolidation had been effected. The resulting confusion is almost indescribable. For, after all, ten presidents, thirty-two vice-presidents, ten secretaries, ten treasurers, ten sales managers and an unknown number of assistant sales managers, branch managers, factory superintendents and salesmen are a difficult group to handle, particularly when they are both astonished and displeased at what has been done by their superiors, and when they are pessimistic as to the workability of the consolidation. In the first year after consolidation net sales were 40 per cent less than the separate companies had attained during the prior year; the substantial net profits of the individual companies had disappeared and were replaced by an operating loss. The total cost of distribution was decreased by the consolidation but the cost per unit was decidedly increased.

Some years ago two manufacturers of a standard commodity decided to merge. Each company had a moderately successful record. Some refinancing was necessary and the bankers who were approached were frankly skeptical. However, they finally agreed to underwrite the securities after it was pointed out to them that the consolidated companies would probably have sufficient volume of business to eliminate the middleman completely, and to conduct their merchandising direct to the consumer by a selling organization completely controlled by the new corporation. After the initial difficulties, always encountered in changing from one form of selling to another, the actual operating results attained considerably exceeded the prior estimates. The actual cost of distributing the merchandise through its own sales force proved to be almost 12 per cent less than the discounts and the commissions previously granted the middleman, and the sales of the consolidation were considerably expanded into new fields which the middleman had not discovered. In this case the decrease in the cost of distribution was very material.

About two years ago three highly successful companies manufacturing totally unrelated products were merged. The merger was based solely upon merchandising, as all of the products were sold to the same general market. The bankers were extremely skeptical. In fact some of them were quite unable to see any reason for the proposed merger.

The results to date, however, have demonstrated the move to have been unusually profitable. No savings in either production or administrative expenses were attained, nor were any expected. The amalgamation of proven high calibre executive talent and the additional efficiency, prestige and effectiveness of the unified sales organization made possible by the consolidation have effected both a marked increase in sales and a decrease in expense of selling. In this short time net earnings are approximately 25 per cent higher than they were before.

An instance comes to my mind almost immediately, wherein several companies manufacturing trade-marked commodities were merged. The sole motive was the decrease in cost of distribution. There was no thought of any other saving. In this particular case the decrease in cost of distribution has more than justified the preliminary estimates. One salesman now covers the territory which formerly required the time of several men. The increased volume has warranted the establishment of warehouses at strategic points which in turn permits the carload shipments which were not previously possible. More frequent deliveries to customers, in smaller quantities, have enabled both the company and its clients to operate with smaller inventories to their mutual benefit, and other savings have been effected which have distinctly decreased the cost of distribution.

The fact that methods which are successful in one industry, or in one line of commodities, cannot be universally applied may best be illustrated by another merger which was effected simultaneously with the above. A group of companies manufacturing equipment for one of our major industries was consolidated. While each product of the consolidation had a distinct place in the industry, nevertheless each article had to be sold on its merits for the particular purpose then under consideration, and in competition with the products of several other manufacturers. The original purpose of the promoters was the elimination of duplication in salesmen and dealers, the theory being that one salesman could cover the territory previously requiring several men, and that all dealers could be eliminated and the territory which they had served could be covered by a few salesmen at less expense than the commission previously paid.

The immediate results were a startling decrease in sales, and it was not until the bankers stepped in and forced a complete change in management policies that the position was rectified. The improvement did not come through in a decrease in distribution expense. Rather, expenses were brought back to the level existing prior to the consolidation. It was found, however, that the larger operation permitted the development of a group of salesmen whose sole purpose was the maintenance of intimate contact with all prospects in their territory. When these men, with their personal acquaintances, were reinforced by specialists, whom they could call in to handle particular transactions, they were able to increase sales over any prior records. The enlarged operation warranted the installation of warehouses at all large centers. Therefore deliveries, an important consideration, could be made in a way which none of the competitors, compelled to ship from their factories, could possibly meet. Many other benefits of the consolidation developed as time elapsed. The merger today is considered one of our most stable and profitable industries.

Some years ago a merger was effected between several companies manufacturing products of general public use. The participants, the promoters and the bankers cited numerous benefits to be derived from the consolidation, prominent among them being the benefits to be derived both by the company and by the consumer from the decreased cost of distributing the several lines of products. It was pointed out that the consolidation would be the only company in a position to quote on a complete line, that both the wholesaler and the retailer could be almost compelled to carry the full line of products, and that the company would be in position to dictate as to this. It was further pointed out that the company would be in a position to undersell any of its existing competitors, should that become necessary. We were recently requested by a group of bankers to undertake a study of the situation of this company, the question asked of us being "Shall we supply additional capital to this corporation or shall it be placed in liquidation?"

It developed that the promoters and executives of the original consolidation had not counted the human element in any of their plans. Wholesalers and retailers refused to be coerced. The dictatorial policies originally adopted were keenly resented and at the first possible opportunity retaliatory measures were instigated. Internal friction developed to such an extent that cost of production increased to a point where sales could not be effected at profitable levels. The competitors were quick to take advantage of the situation. First they hired away the best men of the organization who had become discouraged over the disagreeable conditions which had developed; second, they increased their efforts to take care of the business of the wholesalers and retailers previously dependent upon the consolidation; third, they formed an association which would effectively eliminate competition between the small companies and direct it almost exclusively against the large company.

Instances of this character might be multiplied extensively. I believe, however, that you will have gathered the inference that insofar as our experience goes there is no possibility of answering our question in either the affirmative or the negative. Some consolidations do decrease the cost of distribution, other consolidations increase the cost of distribution. Policies and personnel—in other words, brain power—seem to be the governing factors.

There is such a thing, of course, as foolish economy, i.e., an effort to reduce distribution expenses on the theory that merely by such reduction some benefits are received. More often than not the effort should not be to reduce the number of dollars spent but to see that each dollar is spent more effectively and that it produces a greater volume of business. In this case the reduction of expense is relative rather than actual. In other words the cost of doing business becomes a lesser percentage of the sales dollar.

Based upon our own observations we should say that in general the answer to the question depends, to the largest degree, upon the management. We have seen good management handle very difficult situations so skillfully that distribution and other costs were decreased. Likewise, we have seen poor management make a complete botch of operations which were inherently simple and held every promise of success. If a direct answer to the question is necessary, I must resort to generalizations, injecting a warning, however, that there are sufficient exceptions to these generalizations to furnish the basis of endless arguments.

My first generalization would be that consolidations of companies manufacturing competitive products are less likely to effect savings in distribution than are consolidations of manufacturers of non-competitive but allied products saleable to the same general market.

My second generalization would be that it is easier to effect savings in the cost of distributing standard products which are generally used than to effect savings in the cost of distributing more specialized products, such as machinery, equipment, or supplies which must be merchandised to a comparatively limited clientele.

My third generalization will be a repetition of a previous statement. Real managerial ability is the most important factor; mere size of a consolidation will not result in decreased cost of distribution. Dependence upon sheer mass is futile.

If I must answer the question "Do consolidations result in reduction of distribution expense?" then I must fall back on a precedent established by the Scotch and reply "Not necessarily."

Discussion

Austin Donaldson.[a] Dr. Nystrom has spoken on the question, "Is It Good Management Policy to Assume That Consumer Wants for Particular Goods Are Insatiable?" I think we should not forget the fourth word. Since Dr. Nystrom makes the statement that the answer is emphatically "No," and since he even goes farther and says that it is contrary to ordinary common sense and to daily observation, I find myself in a rather uncomfortable position. I really am in between the horns of the dilemma. If I say "No," I say something which I do not believe, and if I say "Yes," I am bringing down upon myself a rating of a lack of common sense and daily observation.

Do not let us forget that we must look at this question from the point of view of management, from the point of view of progress and action, not from the point of view of the static state. This state has never been in existence and I am sure we all hope that it never will be. We would all prefer to be in the dynamic state, which is the natural state.

Dr. Nystrom admits that economists believe that consumer wants are without limits when general consumer demand is in question. Still Dr. Nystrom states that general consumer demand after all is but a composite of individual wants. I assume from this that the subject may therefore be treated either individually or generally without affecting the question.

Since we live in a dynamic state, we expect motion, action, change and variations. We do not expect the same things to recur during long periods. They have not in the past; why should they in the future? Our national income, as Dr. Nystrom states, amounts to about $90,000,000,000 per annum of which only $42,000,000,000 are consumed in the whole field of retail distribution. Is it not possible that retail distribution might encroach upon the balance of the $48,000,000,000 now going into production, savings, investments and so forth?

Also, has there not always been a steady increase in the national income over a long period of years?

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[a] General Manager, Gimbel Brothers, Inc., New York.

Should management assume that this will not continue? Four years ago cereals dropped off in sales in a certain section of the country. Investigation showed that an oversupply of eggs had lowered the price to twenty-five cents per dozen. Eggs and bacon displaced cereals for a short time. However, it might have been for a long period of time, depending on instances apparently beyond our control. The cereal company did not sit back, however, and assume that consumer wants for particular goods were limited. An aggressive company finally remedied the situation and today the demand for the product continues to grow. It was discovered that the proper attack upon mothers and nursemaids was the way to secure the dependence of children upon a particular food. It must not be forgotten that the change in individual habit of using a particular food from once a day to twice a day, or from three times a week to every day in the week, just doubles the consumption.

In accordance with Dr. Nystrom's statement, it is true that the stomach can hold only a fixed amount of food; let us say twenty ounces. Management, however, does not worry in the least about the capacity of the stomach. What it is interested in is the variety that may be introduced into that stomach which will produce a dollar meal instead of a fifty cent meal. The management which does not believe in demand creation, is bound to lose out in competition with the aggressive management distributing the same article or something similar.

Ford sells millions of cars each year. So does Chevrolet. Ford's production and distribution has increased this year. Chevrolet's has not. Ford's market will not be limited even if it displaces all Chevrolet's, Star's and other cars in that class. Ford will then sell his car to every owner of a Rolls Royce, an Isotta Fraschini, a Minerva and even a Buick. Statistics show that sales in all the stores in the New York district fell off 6 per cent during a certain period. A very few of these stores, however, increased their volume during the same period. They were able to overcome the general tendency downward. To what extent this contrary movement might be carried, not even our economists can tell us.

Some years ago, two hats a year would satisfy our wives. Now, three, four and five, and even more, are required. Some change may vary this upward or downward. We do not know the actual limit until the season is finished and until our sales have been established and even our returns deducted.

The short dress put hosiery on the map. Feminine vanity demanded sheer, delicately-colored hose, short-lived because of texture and numerous because of required color combinations. It came about through the ensemble movement. Even suntan color and seamless hose had to be produced in order to counteract the bare-legged fad, but just let the dress to the boot-top still gain acceptance and the hosiery business will be fatally injured unless management can ingeniously counteract it.

Today yeast is sold in greater quantities as a medicine than as an ingredient for making bread, which was its original use. One bathtub in a home is no longer adequate; even three, four and five are necessary to satisfy a family of three. What is the consumer limit in this case? How far should management respect consumer limits? What is a high limit today is a low one tomorrow. Aggressive, progressive, dynamic, competitive management will always find a way. Some managements have long histories of uninterrupted progress. Others have allowed alibis, excuses and consumer limits to stagnate them. Neither management nor economists know whether consumer wants are satiable or insatiable until a trial has been made to overcome any obstacles that might arise in the attempt to increase consumption by encroaching on income or by surmounting physical limitations, living conditions, fashions and competition. However, it is good management policy to be dynamic and not static.

J. B. Swinney.[4] When I was first handed a copy of Dr. Nystrom's paper, the subject seemed to me hardly suitable for discussion, because the answer appeared fairly obvious. In my opinion the paper gave the only answer to the question. Now I find that my neighbor, Mr. Donaldson, has found a very different and very logical answer, though I still feel that Dr. Nystrom's conclusions are the weightier. Looking at the question from the point of view of one interested in a group of stores scattered from coast to coast, I find myself in agreement with Dr. Nystrom. There is, I think, more to be said on the other side of the question developed by Mr. Milner.

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[4] Director, Specialty Stores Association, New York.

Those of us who are handling dresses in fairly large numbers in a variety of territories have been interested in this matter of the effect of the change of silhouette on our fall business, and as a result of our studies have come to very much the same conclusions as Dr. Nystrom. There are, however, some points relating to this whole question of the satiability of demand that I should like to add to Dr. Nystrom's. The first is in the field of psychology. Though I hesitate to talk on that subject, I think we all realize that there is no stronger advertising influence than that of the fireside. And it has played a particularly important role this fall. When a dozen women gathered together all begin to say that they cannot wear the new dresses, the one woman who has one on is embarrassed. If you multiply this by all the fireside discussions that are going on throughout the country, you undoubtedly have an important influence in reducing the sale of this merchandise, though it is difficult to estimate its extent. In any discussion of the insatiability of demand for particular goods we have to consider the ways of the human mind.

Dr. Nystrom touched indirectly on budgetary control. In spite of the fact that most of us do not like to budget our expenses, I think there has been a great increase in the last ten or fifteen years in the tendency to budget personal expenditures. It seems to me incredible that the common sense attitude of the average family that only a certain percentage of its income should go into certain things could be broken down. This has its influence on attempts to make the demand for any particular goods insatiable.

I realize that a number of outside influences are brought to bear on manufacturers. Among these are the advertising agencies and the advertising departments of the newspapers and magazines. I sometimes wonder if we realize how much influence these high pressure organizations have in settling our merchandise problems. I think we could all find instances in our own experience of outside organizations, without responsibility for our balance sheets, that have had an undue amount of enthusiasm over the possibilities of developing a demand without limit for our product. The cases cited this morning have illustrated how often this overenthusiasm has led to a great deal of grief.

Turning to the other paper, I doubt if a week goes by in which I am not approached by someone representing the founders' group that Mr. Milner has mentioned. They have the notion that it would be a fine idea to take my dozen stores and consolidate them into one big organization. Every time this comes up a number of serious factors come to my mind. My stores are women's specialty stores carrying the better grade of merchandise. They are usually operated by two or three principals who have built up the business, and who have what we call a flair for the merchandising of garments. They have put into these businesses a tremendous amount of work as well as their flair and their personalities. If all these stores were merged and operated by some central office in New York the individual initiative of these principals would be destroyed. Many years ago someone said that any business was the lengthened shadow of some individual. I think this is particularly true of many comparatively small organizations. If we are considering mergers we must also consider the probability that they will involve a loss of initiative of some individual or group of individuals within each of these organizations. The results would, I am sure, be disastrous.

In consolidations we have also to guard against the lack of balance which is apt to be brought about by listening to the overenthusiasm of outside agencies that are not directly concerned with the profits of the business.

The problems involved in building the organizations for these consolidations are also important. In order to build up strong central organizations it is customary to attract the best men away from other organizations with large salaries. I have in mind a particular case. We have a store in one of our cities doing three to four millions of dollars worth of business a year—not a large store but a very successful one. Recently a merger took four people out of that organization in six months. Salaries approximately 50 per cent above what this store had paid were offered. Homes were disrupted and moved to New York. In six months all four people were out of these jobs. Some found other openings and some did not. Our store was disrupted also, and the whole thing was very questionable from the standpoint of the good of the country as a whole. I lived through such a merger about ten years ago. Three hundred stores were to be opened in a year or two. We built up a merchandising organization, of which I was the head, of several hundred people. People were taken from all over the country and paid large salaries. The whole thing went by the board in a year or so, and all these people were set adrift. Many of them were unable to get established again in business, their homes had been sold, and the whole thing was a very disturbing element in the whole industry.

It seems to me most important that these three factors be considered in any question of merging small organizations into one large one. There seems to me no question, as Mr. Milner has said, about the value of consolidations in reducing production costs. From the standpoint of distribution, however, in the cases that I have known, the economies have been of a very questionable nature.

Ralph Borsodi.[5] I should like to make just one point in connection with Dr. Nystrom's paper. In discussing the change in silhouette, Dr. Nystrom left the impression that the confusion today is exceptional and unusual. If you will think back to the previous change in style, I believe you will find that a similar confusion was present at that time. I can remember the confusion which came with the change from long skirts to short ones, and the disappearance of the petticoat. Just the same sort of uncertainty confronted business. One curious difference between that period of change in style and the one now on is that the opposition then came largely from moralists, people who thought that there was something immoral about short skirts. Today opposition comes largely from physicians and those advocates of liberty who believe that the change to the long skirt is going to restrict the freedom of women in some way. I believe that what we are going through today with regard to this change in style is just a repetition of what has very often taken place in the past.

Mr. Milner left us with the strong feeling that it is impossible to answer the question of whether consolidations result in a reduction of distribution expense. From the management standpoint, I believe this may be correct, but, if we take the economic or engineering approach, I believe it is possible to get a very positive answer to the question.

Miss van Kleek made a point which impressed me greatly at your dinner last night. She suggested that it would be a very happy thing if the management engineers were to form a sort of union to keep the economic point of view to the fore. I believe this would be a very useful precept to follow in discussing this question of consolidations.

The teaching, over a period of years, of the economics that follow on the subdivision of labor and the increasing use of machines has been largely responsible, I believe, for the popularity of consolidations. We have come to believe that anything that makes possible an increased subdivision of labor, and an increased use of machinery is certain to result in economic gains. I should like to make the point that the gains that are possible from the increase in the size of organizations are confined largely to the direct field of production. When you come to distribution, even of manufactures, the exact opposite is true. In other words, when you study the history of manufacturing, you find a perfectly amazing record of reduction in manufacturing costs. Usually the study stops at that point, but, if you continue it, you will find that most of the gains due to decreased production costs are lost in increased distribution costs. One way in which I have tested this, in a broad way, has been to study the change in occupations over a considerable period of time. In the fifty years from 1870 to 1920, you find a steady decrease in the percentage of people employed in production, and a steady increase of people employed in distribution. There has been an amazing increase in the number of traveling salesmen, advertising men, and all those in occupations concerned with distribution.

One thing that always brings this to my mind is this curious fact. A student of economics discovered that in the thirteenth and fourteenth centuries the average worker spent from 160 to 180 days a year at work. In other words, the workers at that time worked for only three and a half days a week. At that time, you must remember, there was a large class of aristocrats who did no useful work. In spite of the fifty mechanical slaves that, according to Garet Garrett, are supposed to help every American citizen, the average worker today finds it necessary to work six days a week. We have increased our time at labor, I believe, through our failure to distinguish between the effects of large-scale organization on production and distribution.

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[5] Author and member of staff, Fairchild Publications, New York.

I believe it is worth while to distinguish between consolidations which involve an element of monopoly and those which operate in a free competitive market. Where the monopoly element is present, the consolidation is much more apt to succeed. I think the histories of two consolidations bear out this conclusion. When the United States Steel Corporation was formed, a great variety of properties was consolidated. For many years it was an operating failure. The common stock was down so low that most of us have forgotten it. What saved this consolidation was the fact that iron mines in the Lake Superior district were among the properties acquired by the company. The corporation found itself with a virtual monopoly of these mines from which it was possible to secure the cheapest and probably the best ore of its kind in the world. It was this monopoly of mines that saved the steel corporation. The American Woolen Company, on the contrary, was a consolidation in a completely competitive market. It found no monopoly of iron ore to help it, and the result was a record in sharp contrast to that of the United States Steel Corporation. In all discussions of mergers, I believe it is worth while to ask ourselves whether or not an element of monopoly is involved.

I should like to make one other point. Mr. Milner gave the impression that it is a pretty well accepted theory that large organizations are more efficient than small ones. If by more efficient, we mean able to earn relatively higher profits, I believe that the impression is a mistaken one. On the contrary, I think that the correct theory is that large organizations are not as efficient as small ones. The reason we tend to think of large organizations as more efficient than small ones is that we do not distinguish between aggregate profits and rate of profits. Large organizations are often able to point with pride to their aggregate profits—small ones can often point with pride to a rate of profits which might well shame their larger competitors. The well managed small concern is, as a rule, able to earn a much higher rate of profit per dollar of investment than the well managed large company.

Percy Straus, Chairman.[8] Before turning the discussion over to the floor I am going to take the opportunity to make a few remarks on the two papers. In regard to Dr. Nystrom's paper, it seems to me that the important thing is to determine whether or not it is good management policy to consider consumer wants insatiable. In the first place it is a very difficult matter to determine the extent of demand at any one time. There are so many variables that the results of surveys in this field are apt to be most unsatisfactory. And this has a lot to do with whether the answer to the question put to Dr. Nystrom is affirmative or negative.

Another important matter, that Dr. Nystrom did not stress, is the extent to which price is an influence in limiting distribution. A certain commodity at a certain price may have reached its saturation point, whereas at a lower price it may have a very much wider market. I think this factor should be strongly emphasized. It is one of the variables that adds to the difficulty of evaluating consumer demand.

Dr. Nystrom's view is probably a conservative one, but Mr. Donaldson rather narrowed the discussion when he approached the question purely from the standpoint of the individual distributor. No individual store would admit having so completely covered its market as to concede that demand for a particular product had been met fully until it had succeeded in closing all the other stores distributing that product. But we have to keep in mind that there is always competition, always a struggle between competing plants. If we accept Mr. Donaldson's point of view we must conclude, therefore, that until one organization completely absorbs all possibilities of distribution in one particular line, consumer demand for that line is insatiable. That is not Dr. Nystrom's point of view, however.

Mr. Milner summed up the question of whether or not consolidations result in a reduction in distribution expense when he said that the whole thing is a matter of management. I think Mr. Borsodi's point that the possibility of cost reduction in consolidations lies in the field of production and not in the field of distribution is contrary to Mr. Milner's conclusion, and I hope that we may have more discussion on that point. Mr. Borsodi also pointed out that we find a smaller and smaller number of people engaged in production and a constantly increasing number in distribution. I think that is a natural development of our method of production and of the handicaps attached to the methods of distribution. We have been able by increased efficiency in machinery to create mechanical men who produce very much more quickly and efficiently than humans, but we have not been able to find robots to do our distributing. We still must use for that service humans who can cover only a certain amount of ground per day.

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[8] Vice President, R. H. Macy & Co., Inc., New York.

Mr. Borsodi stated that it took only three and a half days of work to support the population during the thirteenth and fourteenth centuries. We have to take into consideration, however, the difference in standards between those days and today. If any of us were asked to live under the conditions that even royalty endured in those days, I think we would revolt.

Daniel M. Bates.[7] I have been intensely interested in these two papers. As regards the first one, I think there is no conflict between the points of view of Dr. Nystrom and Mr. Donaldson. The doctor's paper deals very clearly with the analysis of the situation at any given time, while Mr. Donaldson, the dynamic head of a great New York business, is thinking of what is going to become of the increase in this country's income during the next six months and the next year. In other words, at any instant we are static, but we are constantly moving on to larger income.

As an ultimate consumer, rather than an industrialist, I should like to make a plea to Mr. Donaldson and to the chairman of the meeting—to all the heads of great distributing agencies, in fact—to spare us a little. I live in Philadelphia, and if I wish to gaze out of the train window as I travel between that city and New York or Baltimore or Washington, I find it impossible to get a decent view of the landscape. It is all boarded up with advertisements of this and that. And the morning mail is full of junk which takes a large proportion of a secretary's time to weed out. Mr. Hoover and Mr. MacDonald have been in conference over some sort of truce in naval armaments. Would it not be possible to get together for some sort of a truce in advertising? Some of you leaders have a great opportunity to get the idea to the consumer that you are going to be the first to save him some of this distribution expense and give it to him in lower prices. We ultimate consumers are paying for having our landscapes made ugly and for tearing up and throwing into our waste baskets this incessant importuning to buy.

I should like to take the viewpoint of the manufacturer for a moment. As Vice President of Day and Zimmerman, Inc., in charge of industrial reports and industrial management, it has been my privilege for a number of years, and still is under Bates Incorporated, which has grown out of the industrial side of Day and Zimmerman, to manage a plant which bleaches, dyes and finishes cotton cloth. Probably few of you here realize that competition in this field has become so keen that an eighth and even a tenth of a cent is important. This plant which we took over six or seven years ago was at the time chiefly dependent on what is called "pajama checks," the raw material for union athletic underwear suits for men. Perhaps you ladies do not know it, but the present fashion for men is the knitted running shirt, which not only has no sleeves but very little sides, and printed running pants. If our business had gone along with pajama checks we would have been sunk long ago, but we went into other things, such as rayon striped shirtings, handkerchief cloths and broad cloths. The point I am making is that the price of pajama checks has been beggared down first to one and one-eighth cents, then to one cent, then to seven-eighths of a cent. It took three yards of goods or less to make a suit of men's underwear of pajama checks. In other words, the difference between the living price of a cent and a quarter, or even a cent and an eighth, and the price that is driving a lot of bleacheries to the wall is only a little more than a quarter of a cent a yard, or three-quarters of a cent a garment.

I am making a plea for the manufacturer, but there are also the converter, the jobber and the retailer, all of whom have to get their profit. By the time the goods reach the consumer the price is about double the price of the goods leaving the converter. In other words, if an article costs fifty cents, you men and women pay one dollar for it. That dollar is paying for all sorts of describable and indescribable things, among them advertising. We of the National Association of Cotton Finishers, of which I happen to be an officer, are trying, without any contravention of the Sherman Law or any of the other anti-trust laws, to support the market so that an established price may be set up for the manufacturers in this industry, just as there is an established price for certain types of insurance. This will mean that a fair proportion of the industry can live, instead of being driven to the wall by this competition. The consumer gets his benefit in service. One of the things that this particular association has accomplished through its support of a livable trade situation is the Nafel fast color label. This is being put into all fast color goods and shows that a sample has been **tested** for color fastness, in accordance with the regulations of the Bureau of Standards in Washington, at the Pease laboratories here in New York. This means that the women of the country and the laundries can depend on the color of these materials. This is a constructive thing that is going to save waste all along the line. As a manufacturer, I plead with Mr. Donaldson, in addition to planning what share of the increase in the income of the country he is going to get, that he plan what additional goods he will sell to the men and women of the country out of the savings made in distribution. In other words, if you can save them twenty-five cents on every dollar they have to spend, we will let them spend that twenty-five cents in your store. I think this a vital matter, and I hope and pray for an easing up on advertising.

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[7] Bates Incorporated, Philadelphia, Pa.

I have had an experience somewhat similar to Mr. Milner's and I want you all to picture the difficult position in which the engineers of the country are placed in making industrial investigations. In inflation times we have been approached a half dozen times by a group of plants wishing us to make a report on a consolidation. Tremendous pressure is brought to bear to get a favorable report which can be broadcasted and used as a basis for financing a new undertaking. We have to maintain the impartiality of the Supreme Court. Many times we have had to lose thousands of dollars because we have had to make an adverse report for which our client declined to pay.

My experience has been chiefly in the management of small businesses and I think there is much to be said in favor of them. What Mr. Milner's paper gave to me above everything else was that there is a personality in every business that must be cherished. It has been my job as an industrialist to get into unprofitable businesses and to try to make them profitable. The same bricks and mortar have brought profit where they were bringing loss. It is the human touch that is essential. A man who has failed under one management may blossom out and succeed under another. He needs understanding and sympathy and access to those in charge of the business. By developing the feeling of interest that exists in every plant I have had the greatest possible help from the personnel of all the plants I have worked with. It is not necessary to start firing and rehiring. Mr. Milner brought out the evils of the sort of wholesale jamming together and firing that take place in the case of many of these mergers. No matter how efficient large-scale production may become, there will always be a place for the small concern because there are people who want to feel that they can get in active touch with the person at the head of the organization. This personality factor will gain economic recognition. We do not want too much mass production, too much standardization. I believe that there is going to be a reaction from this intense mass production, this overadvertising; and that there will be a demand here in America, as in Europe, for more individuality and personality in business life. We need a new impulse to revive the old-time workman's interest in his craft or trade guild.

Mrs. Elizabeth Macdonald.[*] Petticoats have entered into the discussion today. I am emboldened to stand up because I have lived long enough to have worn four at once and am contemplating going back to another next season. It seems to me that the final test in this matter of the satiety of a market lies in the admiration-commanding index of any product that you can call a consumer's good. The market is not satiated until the admiration-commanding index number has begun to drop. In making the sort of truce that has been suggested here, it might not be so fantastic as it would seem at first blush to set up some sort of a Hoover conference that would work out a definitely recognized series of admiration-commanding index numbers for the home purchaser.

In the market studies of today, it seems to me that the greatest wastes are incurred by using as the basis of the analyses women of my uncertain age, who only count as a take-up for yesterday's merchandise. A very great economy could be effected by studying the market of tomorrow, which consists of the early or late adolescent youngsters who are still in school. To any of you who are concerned with market studies I would strongly commend an intensive study of the younger women. It has been said here today that the volume of sales of misses' dresses has increased under the change in style, and the volume of sales of older women's dresses has declined. Do not worry—the older woman will follow the younger one by and by! We have bobbed our hair and we shall change our silhouette. Study the young market!

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[*] Educational Director, Laundry Owners' National Association, Hyde Park, Mass.

O. Fred. Rost.[9] What I get out of Mr. Milner's talk is that mere combination of physical assets does not mean a successful consolidation. We have to add brains to the combination. If we go back over the records of those mergers where brains were not added and where some of the brains that had made up the separate units of the merger were released, we find that these brains went out and started new business enterprises of their own, with very interesting results. In many cases, instead of a monopolistic set-up resulting from the merger, new and often very effective competition was created. This is particularly true in one or two industries.

I know of one case where a large merger involved eight or nine factories in the electrical line. Within a year three individuals who had been released by the formation of the merger had gone into business for themselves. They went to the distributors, because they knew the principals, and secured distribution which increased the volume of their own business so rapidly that it became an actual factor in the total business of the merged concern. They are now facing the problem of either buying out more companies or changing to some other line of manufacture. The sales organizations of these small companies have been able to affect their total volume of business seriously.

In the distribution field, I know of a case of a national chain of wholesalers in which the removal of the individual element in the local distributing units has been so serious that three new distributing houses have been started—in a city not far from here—and all of them have been operating very successfully for a period of three years. One of the principals told me about a month ago that his earnings during the last year were more than twice the salary he had ever received while working for one of the consolidated houses.

If we keep in mind that distribution expense is not going to be reduced unless the consolidation involves at least the brains that made the separate units possible, I think we are going to save ourselves a lot of trouble, in case we are ever engaged in plans for a merger.

A. Irving Schweitzer.[10] I have been very much interested in retail mergers. I have found that when certain stores were brought together in a combination, in my opinion, so much was paid in cash to the owner of each store in the group, and so much for rents and for salaries to the heads of the different departments, that they had very little left for selling salaries, for advertising and for clerical help. Yet they wondered what was wrong with the business. There should be a prompt pre-distribution of expense and every purchase and salary expense should be within the budget of the merger.

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[9] Director, McGraw-Hill Publishing Co., New York.

[10] Business Reporters Bureau, New York.

SPRING MEETING

May 1 and 2—Columbus, Ohio

(See program on page 106)

Men — Not Things[1]

To What Extent Can Large Groups Be Organized and Managed to Realize the Abilities, Capacities and Energetic Efforts of an Individual as Though He Were in a Small Business of His Own?

By **MALCOLM C. RORTY**
Vice-President, International Telephone & Telegraph Corporation, New York

IN ASKING me to appear before you this evening, Dr. Person indicated that the question to be discussed would be "How should large groups be organized and managed to secure the ability, capacity and energetic effort of each individual as though he were in a small business of his own?"

Now it is one of the established conventions in connection with the writing of a paper for an occasion of this kind that the document shall be given a title—and I respectfully submit to you that the preceding question is not only too long, but also too specific and restricted, to be used as a caption. One of the things that even an amateur speechmaker learns early in the game is to choose titles for his speeches that are loose and easy fitting, and that allow him adequate elbow room for occasional wanderings from the main line of his argument.

With the preceding considerations in mind, I have adopted for this paper the title "Men—Not Things"—for such a title represents, I believe, in a broad way, Dr. Person's thought, and the thought of your directors, that the most vital present problem of business organization is to adapt industry to the uses and needs of men, and not men to the needs and uses of industry.

The Growing Importance of the Problem

This problem of the humanizing of industry is a growing one. A very significant result of recent improvements in the science of management appears to be an increasing ability to secure from large units, or "chains," an approach to that efficiency of individual workers that a few years ago could be secured only in the small organization working under the direct supervision of a competent employer-owner.

Under the older types of organization, in which methods of management were relatively undeveloped, each business or industry tended to have its growth limited at a definite stage, beyond which any further increase in the scale of operations ordinarily resulted in decreased efficiency. This limiting size was determined in each case by the point at which a growing inefficiency of personnel tended to neutralize further gains in the efficiency of processes and of purchasing and distribution. A few industries, such as the steel industry, showed continuing gains in process efficiency, with increases in the scale of operations, such as very completely to offset losses in personnel efficiency. These industries could be expanded almost without limit. In addition, the necessities of the railroads, and of the public utilities in general, required expansion into very large units without direct regard to minor losses in the efficiency of personnel. Such special cases were, nevertheless, the exceptions rather than the rule, and the great majority of businesses and industries found themselves limited, by considerations of over-all efficiency, to units of very moderate size.

As opposed to these older conditions, the new industrial organizations are in a condition of rapid flux. Recent developments in management methods, and in accounting and statistical control, are breaking down the former economic limitations as to the size of the individual organization or "chain," with the result that practically all types of business and industry are now beginning to be open to efficient large-scale corporate operation. If this tendency persists, it may represent a fundamental economic and social change having very far-reaching consequences. The field of operations open to the independent owner-manager may be steadily restricted, and the young man of capacity and intelligence may have to look forward, more than ever before, to a career in which, except for some rare combination of good fortune and adaptability to circumstances, he will continue throughout to be a subordinate worker in a large corporate organization.

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[1] Paper presented before a meeting of the Taylor Society, New York, Friday, December 6, 1929.

This forcing into corporation employment of an increasing proportion of men who have natural qualities of leadership and of independence of thought must have its inevitable reactions upon methods of management, and upon the forms and types of corporation organization.

It is important that corporations shall be efficient, but it is much more important that men shall be efficient. These two requirements are not, however, antagonistic. The final efficiency of an organization is the product of the efficiency of its methods, as methods, and the efficiency of its men, as men—and it is the purpose of the present paper to indicate, as far as possible, the compromises and adjustments between men and methods through which the maximum sum total of efficiency may be attained.

The Elements of the Problem

In considering these compromises and adjustments it will be helpful to begin by dividing the problem into its elements. We are concerned, in any case, with large-scale organizations, since the problem under discussion is, in effect, to discover how such organizations may secure in their senior and junior executives that degree of capacity, initiative and energy which is frequently manifested in the management of small privately owned businesses.

In any large scale enterprise there are four major questions which arise:

1. Is the business economically justified as to type, size and location?
2. What should be the fundamental structure of the organization?
3. What general methods of management and operation will conduce to the soundest *esprit de corps?*
4. What special monetary or other incentives should be offered to stimulate the personnel to put forth unusual efforts?

Each of the preceding questions has a direct bearing on the special problem we are discussing. No skill in organization or management can overcome the handicap under which an enterprise that has been started off on a fundamentally unsound basis operates—and the more intelligent and capable the executives of a falsely conceived enterprise may be, the less enthusiasm they may show for its development. Furthermore, no amount of good-will or effort can make a real success of an organization that is fundamentally defective in structure—nor can even a correctly designed organization be effective if it lacks the spark of life that is supplied by a sound *esprit de corps?* And, finally, there are always certain ultimate touches that may be given to the energies of even the best of organizations through well planned premiums for special effort and results.

The Structure of Organization

For our present purposes we may assume that we are dealing with enterprises that have logical reasons for existing, and that, in general, meet the fundamental economic requirements in their particular classes. The initial question is, therefore, as to the structure of the organization. The enterprise may be a chain store system, a public utility, or a factory under one roof, or one with production units scattered over a broad area. Whatever may be the character of the business, its organization is necessarily functional at the bottom. The degree to which functions are isolated and subdivided may vary somewhat, but the principal differences between otherwise similar organizations are apt to be determined by the manner and extent to which some or all of the various functions are consolidated under unit executives having broad responsibilities and authority. One organization may be set up from top to bottom along strictly functional lines. Another, quite similar as to size and operations, may maintain this complete separation of functions only with respect to, say, general finance and accounts, and purchasing and selling, and may consolidate other functions under a series of unit and subunit managers or superintendents, with perhaps a general office staff in advisory relation to the functions so consolidated.

Those who have had experience with a wide variety of organizations will realize the endless combinations and recombinations of functions that may exist, either as a matter of choice, or by reason of the nature and conditions of particular operations. It is impracticable and unnecessary for our present purpose to discuss even typical examples in detail.

The essential point is to recognize the fact that every organization is, and must be, a compromise between the principle of functionalization and the principle of unified and responsible one-man authority. Both principles have their values and each has its defects when carried to extremes.

The highly functionalized organization is apt to be superior in technique; but it is slow to act in emergencies and may throttle initiative in supervisory personnel and finally suffer, even in technical ways, from the growth of a bureaucratic spirit and the mental ossification of intrenched and narrow-minded specialists.

The non-functional, or slightly functionalized organization, is naturally weaker in technique, but is quicker in emergencies and, through competition between units and the allocation of wider powers to junior executives, tends to develop a more resourceful and broadly competent personnel.

The Compromise Plan

As has been indicated before, all good organization, and in fact every good thing, is a compromise. Each new and good principle in organization, as in everything else, tends to run to extremes. Many organizations that have tested out the "functional" principle most thoroughly and for the longest time are now swinging back to a compromise plan, under which definite territories or other general units of the organization are placed in charge of broadly trained managers who are assisted by appropriate staff specialists. Each of these staff specialists is ordinarily in direct relation, on matters of technical information, with a corresponding functional department at the headquarters of the company. New technical principles and specialized methods, developed or approved by the functional departments at headquarters, and approved by the general executive, are put into practice in appropriate operating units of the organization on the basis of specific instructions, prepared by such functional departments and issued over the signature of the general executive. The actual application of such new principles or methods is then supervised by the corresponding staff specialists of the separate units.

Smooth working relations between the unit managers, the functional departments at headquarters, and the unit staff specialists, are found in practice to be assured by observing a few simple principles, as follows:

1. Unit staff specialists should be chosen by the unit manager from a group (preferably three or more) nominated, and ordinarily trained, by the functional department at headquarters.
2. Salary increases for unit staff specialists should be on joint approval of the unit manager and the functional department head, plus, of course, the approval of the general executive.
3. Disciplinary action with respect to, or removal of, a unit staff specialist should be on the same basis as with respect to line subordinates of the unit manager.

In organizations large enough to justify the setting up of several substantially self-contained units the preceding plan has many advantages. The development of specialized technique and methods is advanced rather than hindered by the plan and is apt to take more practical forms, if a reasonable amount of initiative on new methods is left to the unit specialists working in close co-operation with the unit managers. The general authority of the unit managers over all branches of operations tends to prevent "buck passing" between departments and the growth of a bureaucratic spirit along functional lines. Situations involving several functions can be handled more satisfactorily and expeditiously by the unit managers than by several functional representatives; this is of particular importance in dealing with customers and public authorities. And finally, it is possible to secure and retain the services of men of high quality as unit managers, who would chafe under the red tape and delays and the lack of teamwork that are sure to exist where the functional idea is put too rigidly into effect.

In very large organizations it is possible, and sometimes desirable, to carry the unit idea a step farther by appointing subunit managers, in which case the relations of the subunit managers and their staff assistants to the unit manager and his staff are exactly the same as the relations of the latter to the headquarters organization.

Each organization is, of course, a special problem in itself, and the handling of all functions does not need to be the same in any given organization. The essential point is to secure an effective combination of, and compromise between, the functional and unit principles. The word "organization" by its very derivation involves functionalization and, as has been indicated before, all organizations are necessarily functional at the bottom, just as they are necessarily of the unit type at the top. The primary problem is, therefore, that of establishing the most effective system of linkages of functions and personnel between the top and the bottom.

What Is Scientific Management?

The preceding suggestions are not in any way opposed to the principles of scientific management as originally laid down by Frederick Taylor or as practised by the more broadly experienced of his present-day disciples. Yet there is always the danger that general statements of principle will fail to be properly qualified. To quote from your own recently issued handbook *Scientific Management in American Industry*:

"The subdivision of an organization into sales, production and financial departments does not constitute functional organization as developed by Taylor. These are simply logical subdivisions of the general manager's burden, neither new nor radically different from what has been going on along the lines of division of labor for centuries. For the real difference one must go below the upper strata of activities and search throughout the whole group down to and including the workman at the bench. If throughout this group he finds that the natural functions in every case, including the work of the man at the bench, have been definitely determined and entrusted to the responsibility and *authority of some one functional official, unlimited in area and supreme in his own functional field* (except, of course, as in all cases, channels of appeal in cases of disagreement must be established), then he finds the true functional organization designed and so effectively used by Taylor."

And to quote, also, from the index to the original edition of Taylor's *Shop Management,* the "planning department does not involve additional work and expense; *merely concentrates the* planning and *brainwork in one place.*"

In the preceding quotations emphasis has been placed upon those phrases which would seem to indicate that a complete centralization of brainwork and a complete functionalization of methods and processes should take place regardless of the size or geographical layout of the organization. Yet Frederick Taylor, if he were alive and with us this evening, would be the first to admit:

1. That the principle of functionalization produces 90 per cent of its results when applied to a basic unit of very moderate size.

2. That the final 10 per cent of functional efficiency, that theoretically might be obtained by complete functionalization, had best be sacrificed in large organizations in favor of quick response in emergencies and the development of a number of broadly trained junior executives, each in charge of an appropriate operating unit of moderate size.

3. That many enterprises are clearly too large for complete functionalization.

4. That functional instruction of functionalized units has most of the advantages of complete functionalization, with less danger of developing bureaucratic excesses and bureaucratic ossification.

5. That no specialist should ever be in a position where the members of the line organization are not able, on occasion, to put up a successful fight against him.

6. That, to the extent that brains exist, or can exist, in an organization, they should be allowed to function in the closest possible contact with those problems that require special judgment and immediate decision.

7. That the permanent vitality of an organization depends quite as much upon competition between independent units in the development of new methods as it does on competition between such units for current efficiency.

In reference to the preceding, it has been very aptly suggested by Dr. Person that the organizer who thinks always in terms of functions may still continue to think of the unit organization as purely functional by assuming that the unit executives are charged with the "function" of correlating other functional activities and of making special and emergency decisions.

Esprit de Corps in General

We pass now from questions of organization structure, in order to consider the general methods of management which tend to build up a sound *esprit de corps.*

The old maxim that a stream can rise no higher than its source applies with particular truth to a business or industrial organization. It is often said that the president is known by his office boy, and it is a matter of common experience that, in the majority of business and industrial organizations, the character and point of view of the personnel are colored throughout by the character and qualities of the chief executive officer, or of one or two dominant figures on the executive staff. If the chief executive is of high intelligence he will be apt to appoint and retain intelligent subordinate officers. If he is of mediocre intelligence he will tend to surround himself with intelligences of the same type. The executive who has that wisdom and judgment that is higher than intelligence will surround himself with subordinate officials who may outclass him in fundamental capacity, and yet willingly serve him because of his human qualities. On the other hand, the executive who resents independence of thought on the part of his subordinates will, in due time, be wholly surrounded by "yes" men, courtiers and office politicians.

The ideal executive will almost automatically secure from his subordinates all that energy and effort which they might put into business ventures of their own. Competent observers state that 50 per cent of the chief executive officers of the great American corporations represent a reasonable approach to this ideal, while, on the other hand, 25 per cent are deficient in intelligence, and another 25 per cent are deficient in fundamental character. It is, however, easy to criticize and difficult to suggest a remedy. Corporation chief executives on the whole represent a superior rather than an inferior cross section of the American people. A considerable number of such executives head industries which they themselves have developed; others are the accidents of circumstance; but the great majority represent the best selections that boards of directors have been able to make.

To improve the quality of chief executives as a whole it will be necessary to improve the judgment, if not the qualities, of the average board of directors. Some gain might be made if the average board of directors knew where it could call upon personnel experts of adequate standing and capacity to make at least a routine check-up of the candidates in sight when a new election was to be made. Every man who is a candidate for an executive position should be examined from three angles—from the top, to find how he deals with his superiors; from the side, to see how he deals with his associates; and most important of all, from the bottom, to see how he deals with his subordinates. If all prospective chief executives of corporations could be examined from these three angles, it is probable that many mistakes might be avoided, and some part of the special problem that we are now considering might then be solved.

A further suggestion that has been made is that the board of directors, in addition to the annual financial audit, should secure an annual personnel audit, with the idea of checking the more obvious abuses that take place when the chief executive falls short of ideal qualifications.

None of these suggestions can be looked upon as more than an indication of a growing attention to the dominating importance of the chief executive's position. The fact remains, however, that personnel work in the lower ranges of corporate organizations has advanced far beyond that in its upper ranges, and that further progress in the quality and character of corporate organizations will depend very largely upon the extent to which chief executives are intelligently selected for their work, and cease to attain position, as they have in the past, very largely by chance or through success in political struggles for preferment.

What has just been said does not pretend to be a complete answer to a question that will probably sprout perennially, so long as human beings are human beings. Yet the facts indicated must be recognized when the question is asked, "How should large groups be organized and managed to secure the ability, capacity and energetic effort of each individual as though he were in a small business of his own?" The beginning of any answer is—first select a good chief executive.

When a capable chief executive has been established in office and an effective plan of organization has been adopted, the work of building up a sound *esprit de corps* has, of course, only begun. It is unnecessary to discuss here in detail all those elements of management that have been found useful in developing and maintaining the loyalty and energies of a working force. But it may, nevertheless, be worthwhile to consider certain expedients that are sometimes overlooked by even well trained and competent executives.

The Value of Definite Objectives

The first in importance of these special expedients is probably that of setting up a definite annual objective for each executive. This may be measured in the efficiency of production, or in volume of sales, or in such other manner as is appropriate to the particular business involved—the important thing is that each junior executive shall have laid out for him, or preferably shall lay out for himself, each year, a tangible objective for next year's work. The skillful executive will avoid arbitrary "bogies" and will seek to set up in each case an attainable, but not too easily attainable, objective. In many cases he will restrain the optimism of a junior executive who may wish to undertake an impossible task, just as in the reverse direction he may raise the limits of effort somewhat for those who are inclined to set too easy a pace. In some instances situations will develop, or exist, where a failure to go backward will represent high achievement, and it is quite as important that these special conditions shall be recognized, as that adequate programs for improved performance shall be established in other cases.

This personal measuring up of each junior executive's problems by the chief executive is one of the most important jobs that the chief executive can undertake, since nothing destroys the morale of an organization more rapidly than for mediocre men to secure advancement and credit, and for good men to be discredited, for reasons beyond their control. Certain factors in performance can always be measured with substantial fairness in a mechanical way, but the use of arbitrary bogies in all cases is usually more harmful than the crudest work that can be done on the basis of a full study of all the factors involved in each situation.

Since this question of bogies and of credit for performance strikes so directly at the question of organization morale, it is frequently desirable for the chief executive to utilize a disinterested committee of his subordinates for the establishment of the annual objectives. It is important that the members of this committee shall be capable and disinterested, but it is even more important that they shall be so recognized by the junior executives whose performance is to be measured on the basis of their decisions.

Freedom for Experimentation

An entirely separate problem from the setting up of an annual and other objectives is that of allowing to the junior executives, and perhaps even more particularly to the unit staff specialists working in association with such executives, a reasonable latitude for the trial and development of new methods. The initial setting up of standardized or semi-standardized methods throughout an organization, if done intelligently and with due regard for special conditions, need not be destructive of organization morale and initiative, provided it is clearly understood that suggestions for future changes and improvements will always be welcome.

Experimentation and change always cost money, but a skilled executive will always permit an occasional experiment to be undertaken, even though in his opinion clearly foredoomed to failure, rather than to have the impression spread throughout the organization that no suggestions for changes in methods will be welcome. It is even possible to set up a definite routine for experimentation, under which the requirements will be:

1. That the junior executive proposing a change in methods shall outline in writing the proposed change, the advantages expected, the cost of an experimental trial and, finally and most important, the cost of reverting to standard practice again if the experiment proves to be a failure.

2. That any experimental change shall be submitted in advance to the appropriate general staff specialist and shall not be undertaken unless the junior executive, after studying the comments and criticisms of such specialist, still feels that the experiment will be worth while.

3. That the annual cost of all field experimentation shall be limited to a sum total representing a reasonable outlay for the maintenance of this particular type of initiative in the various units that are involved.

Uniformity in Personnel

Still a further consideration, closely connected with the building up of a sound *esprit de corps*, is that of establishing a reasonable uniformity as to the intelligence and character of the individuals that are on similar levels, or are otherwise brought closely into contact within the organization. It is a very true saying that there is no hatred like that of a second-rate mind for a first-rate mind. There may be a few rare first-rate intelligences that have the Machiavellian qualities necessary to avoid conflict with second-rate intelligences but, generally speaking, the conflict between the two is bitter and inevitable, and will be aggressive on the part of the second-rate intelligences as long as these are in the majority. If, therefore, an executive wishes to raise the standard of any group, by introducing one or more higher intelligences, he must be prepared to see these conflicts continue until the second-rate intelligences are reduced to a minority and are thus compelled to assume a defensive position.

A very similar situation exists when the differences are those of character rather than intelligence. The old saying regarding the single bad apple in the barrel holds true in such cases, and the retention of even one selfish and unscrupulous individual as a member of an otherwise sound group may do damage to the organization morale that much earnest effort in other directions cannot offset.

The necessity for a reasonable uniformity in intelligence and character arises in considerable part from the need for uniformity in practices and treatment with respect to members of any given group. The authority and latitude that may be given to men of intelligence and sound character will very certainly be abused by those of lower qualities. In a similar way, the restrictions and closeness of supervision, that are necessary in dealing with unintelligent and unreliable employes, will be seriously resented by those who are trustworthy and intelligent.

To assure a reasonable uniformity in the character and intelligence of the members of any given group in an organization, one of the most useful and effective expedients is that of having all new appointments and promotions passed upon by a selected group of junior officers, who are in position to act disinterestedly and without embarrassment and represent, as nearly as possible, the upper level in character and intelligence of those who are to be appointed. Long experience justifies the statement that a selected group of this kind will recommend appointments and promotions of a sort gradually to raise the quality of personnel and the standards of performance, and will do a much better job in this respect than can be done by a single executive, or even by a skilled personnel officer, working alone. The groups that are called upon for such advisory work should not, however, be determined arbitrarily on the basis of position or title, and should be varied from time to time according to circumstances. In general, it is better that the consultations should be in confidence with the executive and that the group should not even meet formally as a committee. If this procedure is followed, and if, in particular, the individuals consulted are known to be thoroughly respected throughout the organization, the morale of the organization will be steadily built up, and office politicians and trouble makers will be automatically eliminated.

The Dead-Ended Employe

And now for a final special consideration bearing on the question of general *esprit de corps*. The progressive executive is almost certain to draw to himself an excess, rather than a deficit, of talent. His organization will be alive and constantly changing rather than fixed and immovable. Under these conditions he will find, as time goes on, an increasing tendency for both the older and the younger men to become dead-ended without adequate chances of promotion. Such conditions inevitably react upon morale, and the skilled executive will make it one of his primary obligations to seek outside of his own organization, if necessary, for opportunities into which these otherwise dead-ended individuals may step, not as a matter of compulsion, but as a matter of free choice. The good executive may occasionally lose a desirable subordinate if he maintains always an attitude of willingness to see any subordinate better his opportunities, but his reputation in this respect will spread and an occasional loss of the kind indicated will be more than offset by the improvement in the caliber and qualities of incoming applicants.

The Use of Special Incentives

As has been indicated before, the organization that has a thoroughly sound general *esprit de corps*. will be apt to secure almost automatically from its personnel the limit of their efforts and good-will. Nevertheless, there can be no question as to the advantage of paying tangible premiums for tangible and directly measurable results. However, to discuss in detail even a fraction of the bonus and premium plans that have been proposed or are in operation is impracticable for our present purposes. The most that can be done is to indicate a few cautions and safeguards.

The first of these cautions is with respect to the setting up of any plan on the basis of purely theoretical considerations as to how employes should feel and act. It is a general and very excellent rule, in attempting to learn any particular fact, to ask some person who knows that fact. So, in setting up premium and bonus plans, it is an excellent idea to be governed more largely by the judgment of those who are to be affected by the plan than by theoretical considerations. If the problem is put to any group of employes to determine the most desirable apportionment of any total expenditures for services, between fixed salaries and premiums, and to determine also the basis on which the premiums should be paid, it will frequently be found that the solutions arrived at will differ very greatly from those that might be assumed, theoretically, to be most effective.

In general, if the organization morale is high, the best results will be obtained if the special premiums, while large enough to seem substantial, constitute, nevertheless, a relatively small proportion of the total payments for services. This is particularly true when premiums are to be paid to those in executive positions, owing to the fact that premiums paid on the judgment of a single executive, or even of a committee, are always looked upon as being tinged with favoritism; while, on the other hand, premiums paid on the basis of any arithmetical calculations are always exceedingly difficult to adjust to the merits of executive performance.

Conclusion

And now to conclude—the Taylor Society is described as a society to promote the science and art of administration and management. The science of management deals primarily with methods, but the art of management must deal primarily with men. The science is relatively easy to learn; the art is difficult. It may be going too far to say that, if the art is really *studied,* the science will take care of itself. Nevertheless, those who are interested in the true development of scientific management should keep always before themselves the distinction between the two; for the corporation that secures unity of purpose and action in a loyal federation of natural leaders, working under a trusted chief, will always win in the long run in competition with an organization that ranks the science of management above the art—that values Things above Men.

RESULTING from the recognition of the fixity of non-human factors in managerial situations, the search for laws which govern co-operative activity, and the recognition of the importance of analysis of functions, was consideration of human adjustments in accordance with capacities. Certainly one outstanding achievement of modern psychology is proof and measurement of variability in characteristics among individuals; of a norm and dispersion about the norm with respect to any characteristic. But before this new psychology had appeared, the management movement had begun in practice to disregard the traditional assumptions that all men are created equal in ability, that any man can do anything, and to seek men adapted by nature, training and experience for particular functions.

Taylor was a pioneer when he incorporated this point of view into his technique and his philosophy. The first man he selected at Midvale was a skilled (adjusted) man, and thereafter much of his attention was given to discovery and definition of capacities for particular operations . . . . It was an essential part of the new outlook toward management that effective joint effort of complementary specialists working for the accomplishment of a common purpose must be *truly* co-operative; must be effort in which there are in general common desires and motives, and understanding and acceptance of the nature and effects of specific acts. Predetermination and effective execution of planned action cannot be established without these . . . . (The Taylor Society, *Scientific Management in American Industry,* pp. 29-30.)

Stores Room Control[1]

New Methods in the Organization of Stores Rooms

By **C. BERTRAND THOMPSON**[2]
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IN 1920 I was asked to organize the central stores rooms of a large chain store system in France, at that time the second largest and now the first. The company had in 1920 two depots, feeding each about four hundred branches. In accordance with the usual French system, each branch carried a small stock of about Frs. 30,000 ($1,200) consisting of dry groceries, family wines and liquors, small dry goods, shoes, kitchen utensils and other articles of daily consumption in small towns and villages. (The financial, sales and administrative organization of these French concerns, which show profits uniformly much higher than those of American chain stores, is worth study also.)

It was decided to begin with the organization of the dry goods, shoes and kitchenware departments, leaving aside for the moment the groceries and wines. This was due to the fact that the dry goods and the kitchenware departments were managed by a young man, son of the founder recently deceased, already wide awake, progressive and aggressive, and now (1929) the director of the whole affair which has taken on a still continuing and very remarkable extension. In 1920 the other departments were managed by elderly and conservative associates and contemporaries of the founder. Their attitude toward the son ("young George") and all his ideas was at the best one of a benignly tolerant scepticism and at the worst of openly expressed distrust and active opposition. I was engaged by "young George."

In 1920 the departments to be organized occupied an old building or a series of buildings, built at different times, one against the other, in the usual French provincial way—each building with ground floor and one story, and the upper floor of each building on a different level from that of the others, with steps in the passages from one building to the next. The merchandise was received and verified in each department, stored in bins of all shapes and sizes, or on shelves, or left in cases on the floor. The tagging was done when an order was received from a branch manager. The manager of each branch was allowed per week one large order to be shipped by ordinary freight, and two small orders by fast freight. Branches within twenty-five miles of the center were fed by automobile trucks, but followed the same rule. There were on the average about seventy main orders per day and 140 special orders for quick delivery. This meant a total of 1650 lines per day, a line being any quantity of one kind or size of article, at one price; for example: 6 pairs of shoes, size 8 C, at Frs. 38; 3 pairs of shoes, size 8 D, at Frs. 38; 4 shirts, Number 24, size 32, at Frs. 16; 6 mouse traps, Number 12, at Frs. 6.

At that time these orders represented about sixty tons of merchandise to be prepared and shipped per month. These small orders were and are the characteristic and normal expression of the old established merchandising principle of the house: small and frequently renewed stock in each branch (one little branch store to about eight hundred inhabitants) and just sufficient stock in the central depot.

Orders were made out by branch managers in duplicate, the original sent to the depot where the numbers, designations and prices of each article were verified, and the quantity ordered usually reduced. The orders then passed to the "preparation"; that is, to the clerks who got out the merchandise ordered, an operation which required them to go all over the stock room and up and down stairs with small wicker baskets which they filled and returned for verification and packing on the first floor. The goods were then sent down a chute to the shipping department. The orders were sent to the billing department, where copies were made with corrected prices and quantities, managers' commissions figured, and one copy mailed to the manager. The personnel necessary for these operations (not including the billing) was at that time fifty-two.

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[2] Before the War Mr. Thompson was associated with Harvard University as Lecturer on Manufacturing. He is the author of *The Theory and Practice of Scientific Management* (1917) and editor of *Scientific Management* (1914), a collection of the more significant articles on the Taylor System of Management. Both of these works still stand as authoritative sources of information on the subject. Mr. Thompson has recently published a French book entitled *La Réorganization des Usines* (1928). Since the War Mr. Thompson has been located abroad and has numbered among his clients many prominent European industrialists.

The organization at this stage was confined to the preparation and packing of orders, and to a systematic repairing of packing cases. These were usually the cases in which the merchandise had been delivered to the depot. Without going into the detail of this stage of the organization, suffice it to say that the personnel was rapidly reduced to forty-six. I will call attention only to one detail, which became very important in the second stage of the organization which followed. This detail consisted in clearing out a space on the first floor over the shipping department, and using it for storing a completely representative stock drawn from the entire stores room. This central stores room, which we called the "preparation," contained from three to six days' supply of each article, of which the main stock was kept in the "reserve." The obvious and immediate advantage of this was to concentrate the movements of the preparation clerks in a very small area. This necessitated, of course, a continual restocking of the preparation from the reserve. The consequence was to reduce the number of preparing clerks from six to three, while one man assured the restocking. At the same time the delay in filling orders was reduced from an average of three days to an average of one.

The rapid growth of the business soon made it evident that larger and more convenient quarters must be secured for the stores rooms. It was decided to install them in a rectangular building in another part of the town with a ground floor 300 meters by 120 meters, half covered by a first floor. This gave me the occasion for a radical reorganization, whose general principles I had been maturing during the organization of the old stores rooms.

Before describing this in detail it is worth noting that, when the new organization was finished, the number of lines prepared had increased from 1650 to 3500 per day, the tonnage from 60 per month to about 130. The entire work was also being done by thirty-five employes instead of the one hundred that would have been necessary if the personnel had been increased in the same proportion as the increase in the business. As a result of this success, the opposition of the other directors to these methods was overcome, and they were applied to the much more important grocery department with even more striking results; for example: reduction of the personnel from 105 to 30 coincident with an increase of tonnage of more than 100 per cent. In the case of the grocery department, however, this result was attained chiefly by a very special mechanical equipment, which falls outside the scope of this article in which I propose to describe chiefly such modifications of stores handling as involve no new or very special mechanical changes.

The first step in the new organization was obviously to analyze the problem and divide it into workable units. This analysis immediately showed the following as the most important groups:

1. Purchasing and Maintenance of Stock
2. Receiving and Inspection
3. Tagging
4. Moving to Reserves
5. Moving from Reserves to Preparation
6. Preparation
7. Verification of Preparation
8. Packing
9. Weighing and Shipping
10. Billing and Bookkeeping Control

Each element was studied in detail, stop watch in hand; many alternative solutions were investigated and rejected. The solutions finally accepted were rigorously time studied and put on task and bonus. Detailed instructions and instruction cards are in force for each operation. Bonuses for employes and also for bosses go as high as 55 per cent of the wage. In view of the great variety of articles, these time studies are sometimes extremely complicated, but in every case the results have been reduced to simple and easily verifiable form. Bonuses are calculated daily, and in the case of the tagging clerks, who are fourteen- and fifteen-year old girls, they are paid daily.

We will consider here only the solutions adopted, with special emphasis on those elements in which new methods were applied.

1. *Purchasing and Maintenance of Stock.* Here

I applied the classic Taylor methods: balance sheets, symbolization of merchandise, maximum and minimum limits, purchase requisitions and purchase orders, together with stores issues of a special form necessitated by the division of the stock rooms into reserves and preparation. This division allowed me to apply to the preparation the principle of the fixed inventory such as Taylor applied to tool rooms. We determined the amount of each merchandise which in principle should be maintained in the preparation. At the time of the annual inventory this amount was stocked complete for all lines. This obviated the necessity of accounting for each daily delivery from the preparation and permitted us to carry on the balance sheets only the stock of the reserves, thus greatly simplifying the stores accounting.

2. *Receiving and Inspection.* This also followed the classic lines, with one important modification made necessary by the fact, first, that each article before going to the reserves had to be tagged (catalogue number and price) and second, that all merchandise was to be placed, immediately after tagging, in standard bins where it remained, through all operations, until taken out for shipment. This required, first, that the receiving clerk be advised, on the back of his copy of the purchase order, of exactly the type of tag and the quantities of tags to be used together with the price, as it was his business to deliver the tags (after having them printed on our special machines, if necessary), to the tagging clerks; second, that he indicate to the "encaisseuse" (the clerk who puts the merchandise into the standard bins for delivery to the reserves) the type of bin to be used and the quantity to be put in each bin, and third, that he prepare the bin tags. This information also was given to the receiving clerk on the back of his copy of the purchase order.

One mechanical trick must here be mentioned. Merchandise taken from the supply cases, verified and accepted, was stacked on simple platforms about 30 by 40 inches, mounted on four large steel balls on which they were pushed the length of a number of tables perpendicular to the table from which the distributor took them for delivery to the tagging clerks. As each board or tray was emptied it was passed through a slot under the same table to an inclined plane which brought it back by gravity to the point of departure. The sketch in Figure 1 will give an idea of the arrangement of these tables together with the tagging and the filling of bins for delivery to the reserve. (It will be noticed that there is a gravity conveyor running beside the tables. This conveyor is for certain merchandise which is delivered already tagged by the manufacturer and placed at once by the receiving department into standard bins which go directly to their reserve.)

3. *Tagging.* This operation is done at a series of tables whose general form and disposition is indicated in Figure 1. Each tagging clerk has a part of the table separated from the others by a board separation just high enough to prevent distraction and conversation. The clerk sits at the center of the table to which she gains access by lifting a part which is mounted on hinges, and which she closes when inside, so as to have the whole table at her disposition. On the table are marked the places for each sort of tag, for needle and thread when necessary, for the specially designed glue pot and for her job card which indicates the work to be done, the time allowed for it, and the premium earned when the task is accomplished. The head tag clerk distributes the work to each tag clerk, together with the tags and the job cards, from the table on which she has received them from the receiving department. In order to avoid the necessity of taking articles off the boards on which they arrive, the head clerk has, in the passage between her receiving table and the tagging tables, a small sliding table over which she pushes the merchandise to the tag clerks.

It is not surprising that in view of the variety of articles (about five thousand different kinds) and of tags (which after standardization were reduced to five varieties), the job of establishing tasks for tagging occupied one time-study man the greater part of a year. The result, however, justified the expense, as finally seven tag clerks did the work which formerly would have required at least eighteen, and each of the clerks was getting a premium of 55 per cent of his wage, thus assuring a permanent and highly skilled staff for this work. In view of the limited space at our disposal, the saving of space which resulted from this reduction in personnel was also of inestimable value.

4. *Moving to Reserves.* An important innovation in this kind of stores room came into play here; namely, a radical application of the Taylor standard

bin system. Members of the Taylor Society are all familiar with the standard rack and bin which permit perfect interchangeability and practically complete utilization of available storage space. For French practice I have adopted the following dimensions for standard bins: Whole bins: 60 by 60 by 50 centimeters (50 centimeters being the depth in all cases); half bins: 30 by 60 by 50; quarter bins: 30 by 30 by 50, or 15 by 60 by 50, etc.

Obviously, the racks are multiples of these dimensions, plus the thickness of the shelves. The racks are usually three or five tiers high, it being possible to use three tiers without a ladder, while five tiers require its use. In the particular case now being described I use three-tier racks in the preparation and five-tier racks in the reserve. In order to facilitate taking the bins from the racks, I have the bins project one centimeter, giving them, therefore, a uniform depth of 51 centimeters, while the other dimensions remain standard.[8]

The novelty in this case consists in *putting the merchandise in its appropriate bin immediately after tagging, and effecting all movements and all accounting from that point on with the bin as the unit.* Thus the bins are moved from tagging to reserves by gravity on roller chutes on the same floor, or by automatic elevators or chutes to floors above or below. The standardization of bins permits a corresponding standardization of mechanical transport equipment. When they arrive at the end of the chute or elevator in the reserve the bins are stacked on platforms and distributed by elevating trucks to their racks in the reserves. On the receipt of the order from the preparation, described later, an attendant in the reserves takes out the bin and delivers it on a truck either to its corresponding rack in the preparation, if on the same floor, or to the chute or automatic elevator, if on another floor. In the latter case the bin, on its arrival at the preparation floor, is placed in its proper rack in the preparation. When the articles are taken out progressively to fill orders from branches the bin is finally emptied. It is then taken out and delivered to the tagging department, where the cycle recommences. The advantages of this method are the following: suppression of all rehandling article by article; reduction of damage due to rehandling; simplification of accounting and control, to such an extent that in this particular case the entire movement in the reserves is assured by one man and one woman, and the whole stores balance keeping is done in part of the time of one employe.

To return, then, to the transport to the reserves, the "encaisseuse," when the tagging of a lot is finished, verifies the tagging and then, in accordance with instructions accompanying the merchandise from the receiving department, selects and fills the type of bin required, putting into each bin the quantity indicated and sending it to its proper reserve. This quantity prescribed for each bin is such as to leave a space free for a number of articles fixed in advance, This number is the minimum at which the preparation clerk sends a requisition to the reserve for a new bin. It is probable that the new bin will arrive at the preparation before this minimum quantity has been taken out for branch orders; and it is therefore necessary to find the place in the new bin for this minimum, as the old bin is immediately emptied and sent back to the tagging.

5. *Moving from Reserves to Preparation.* Each bin as it is filled has attached to it, by a soft iron wire passed through a hole punched in the edge of the bin, a tag (Figure 2). This tag has a copy of the article tag attached, to identify the article. On the bin tag is noted the name of the tag clerk, in order to trace responsibility in case of error; the quantity in the bin; the minimum quantity; the symbol of the location in the reserve; the symbol of the location in the preparation. When, in the preparation, the number of articles in the bin falls to the minimum indicated; for example, 6 pairs of stockings, 3 pairs of shoes, etc., the preparation clerk detaches the bin tag and sends it to the reserve, after stamping on the back the hour and minute at which it leaves the preparation. The bin tag is sent to the reserve by a kickback which throws it into a basket and at the same time starts a bell ringing. The bell continues to ring rather disagreeably until the reserves attendant comes and stops it, which he can only do when he is before the basket. The bin tag serves as a stores issue. The reserves attendant gets out a bin of the

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[8] In a recent installation I used seventy-five racks, each six tiers wide and three tiers high, and 150 racks six tiers wide and five tiers high. The cost per rack of the former, in pine wood, was Frs. 370 ($14.80) and of the latter Frs. 610 ($24.40). Seven thousand half bins, made of beech, were used at a cost of Frs. 12.25 ($.49) each; four thousand quarter bins of the same material at a cost of Frs. 8.25 ($.33) each, and four thousand eighth bins of the same material at a cost of Frs. 6.50 ($.26) each.

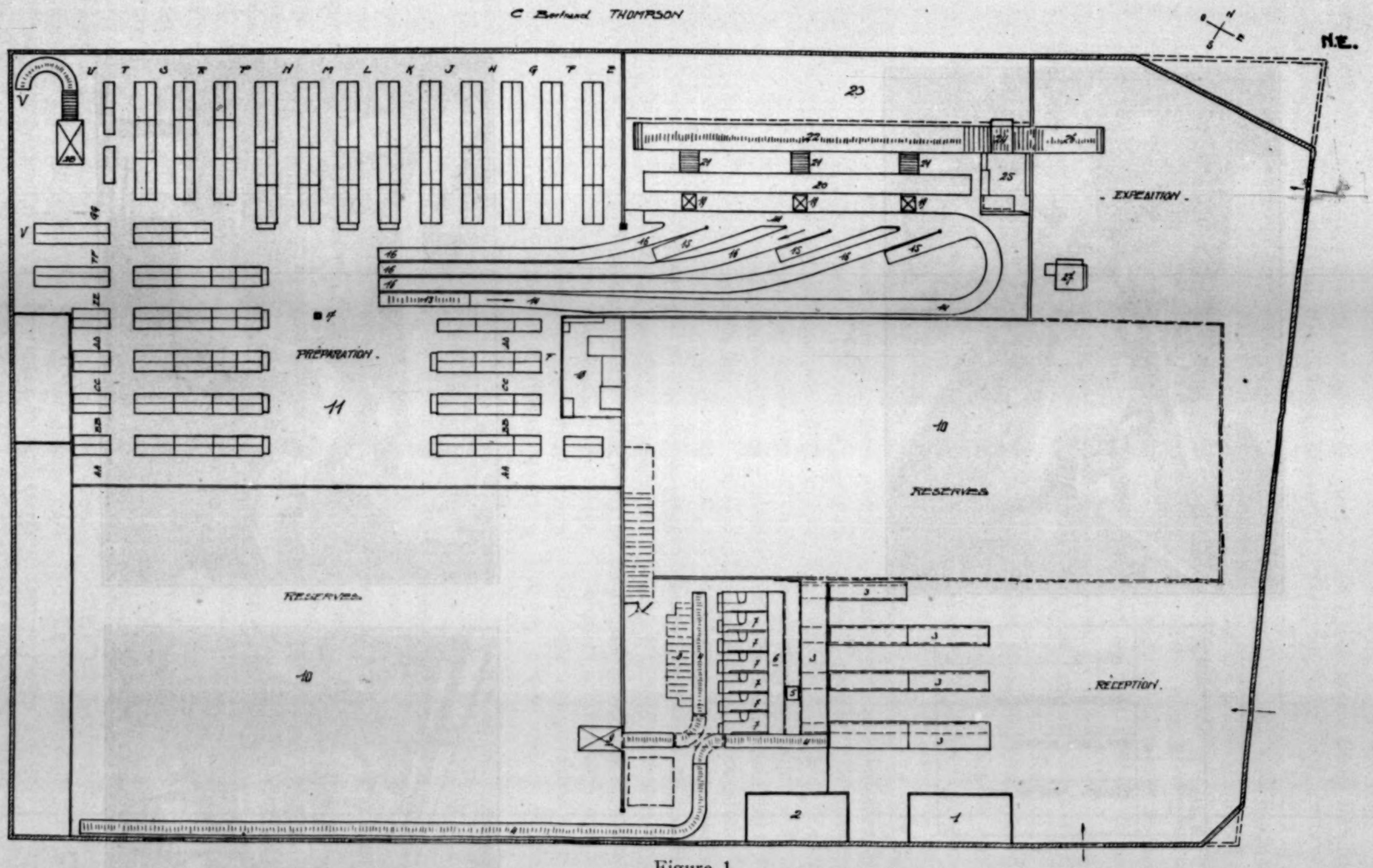

Figure 1

This sketch represents the ground floor of the stores room on a level with the floor of a freight car. The other floors are occupied by other reserves. The numbers on the plan are to be understood as follows:

1. Office of the receiving clerk.
2. Tag printing machines.
3. Receiving department tables with sliding platforms.
4. Gravity conveyors from tagging to reserves.
5. Sliding table between receiving department tables and tagging distribution table.
6. Tagging distribution table.
7. Tagging tables.
8. Space for empty standard bins.
9. Automatic elevator to first floor reserves.
10. Ground floor reserves. Installed with standard racks and bins not indicated on the plan.
11. Preparation. Note the fan-shaped arrangement of the racks.
13. Booster for basket trucks.
14. Inclined plane leading to inspection.
15. Side track for waiting baskets. preparation.
16. Inclined plane for return of baskets to
17. Loud speaker and overhead carriers communicating between preparation and inspection.
18. Office of the preparation head clerk.
19. Sliding tables for inspectors.
20. Inspection table.
21. Sliding tables for packers.
22. Gravity conveyor for packed cases.
23. Reserve of empty packing cases.
24. Scales.
25. Office of shipping clerk.
26. Conveyor to shipping department.
27. Standard table for repair of standard folding cases.
28. Automatic elevator from reserves to preparation.

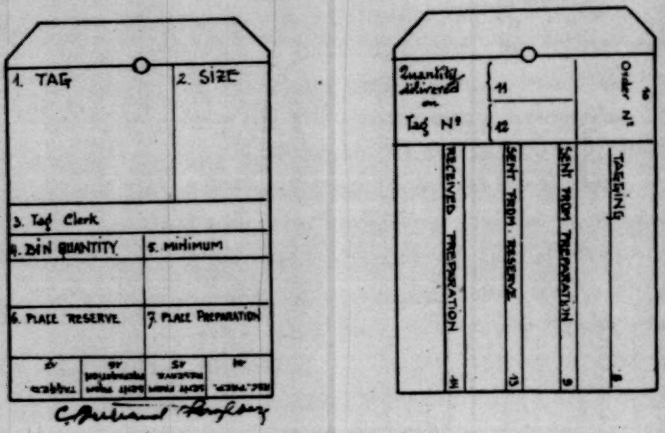

Figure 2

Figure 3

Figure 4

Figure 5

same article and delivers it with its tag to the preparation, noting on the old tag the quantity delivered and the number of the new tag. At the same time, he stamps on the back of the old tag the hour and minute at which he delivered the merchandise to the preparation; and at the preparation the hour and minute of reception are also stamped on the same tag. Fifteen minutes are allowed between the time the tag leaves the preparation and the time the new bin is delivered to the preparation. This time is verified by the time stamped on the back of the tag. After stamping the old tag is delivered to the balance clerk, who notes therefrom on the balance sheet the quantity delivered and the balance remaining in the reserve.

6. *Preparation.* In order to facilitate the preparation of orders and the billing, I was led to make a radical modification in order forms, which would take too long to describe here. The orders received in duplicate pass first by the control office whose chief business is to mitigate the ambitions of the branch managers by reducing their orders to a point which leaves them just enough for their current needs. Rapid turnover is thus assured. The orders are then given, still in duplicate, to the preparation clerks, divided as equally as possible between the three clerks employed at that work. Each clerk takes from the center of the preparation (by preparation I now mean the concentrated stores room which is the essential feature of this system) a large wicker basket, mounted on rubber-tired wheels with roller bearings, that goes between the racks in which the articles have been arranged according to symbol in the same order in which they are indicated on the branch manager's order. She takes out the quantities asked for and at the same time corrects, if necessary, the price or the catalogue number, puts the merchandise in the basket truck, and finally brings it back to the center, from which she starts with another truck and another order. In the meantime, of course, she orders new bins when necessary, as described above. It is now fairly obvious—and this is the really important new feature of this organization—that *the separation of the stores room into preparation and reserves has reduced enormously the distance to be covered by the preparation clerk for each order, thus saving the greater part of the running-about time formerly taken by each clerk.* In this particular case, instead of having to run over five thousand square meters of space, she has only to cover about three hundred square meters. This fact, together with certain other details and the use of a task and bonus system, explains why the handling of the merchandise and the filling of orders in the preparation and reserves required finally five persons instead of the eighteen or twenty that would have been required under the old methods.

I may be permitted to insist here on the applicability of this method to a wide variety of enterprises. I myself later applied it first to the big supplies stores rooms of the Chemins de Fer de l'Est (Eastern Railroad) at Hoisy-le-Sec, near Paris, with similar results. At about the same time I organized the largest wholesale druggist supplies house in France in the same way. This system is now being installed by myself and some of my former engineers in many other chain stores, mail order stores and factories, always with results more or less similar. Of course, it is not of universal applicability, as any factory manager or department store manager will see, though I may call attention to the fact that the sales departments of a department store stand in the same relation to reserves as does my preparation in a stores room to the reserves. If I were to try to formulate a rule, I should say that this method is to be used with advantage in all cases where the stores room occupies a large area and must deliver at frequent intervals comparatively small quantities of practically every variety of merchandise stored. The time required to prepare an order is almost entirely occupied in running from one point to another in the stores room, and it is clear that this time is reduced in proportion as the area of the stores room is reduced, on condition that in the reduced area (the preparation) is found a complete representative stock. As the restocking of the preparation from the reserves is done in larger units, one or several bins at a time, and at rarer intervals—in practice from three days to a month—it is evident that the moving time in the reserves is very much less than it would be if each detailed order were filled from the reserves.

The remaining operations 7, 8, 9 and 10 were also studied and modified in the same spirit, with a resulting mechanization which contributed materially to the reduction of the personnel. As, however, this presents no new principle, it can be rapidly and summarily described.

In order to avoid manual handling, a booster and a chute were interposed between the preparation and the verification. The basket truck with the merchandise and the order is rolled on to the booster which deposits it on the chute. The basket arrives on a platform beside the inspector, and as each inspector must have several baskets ahead, there is provided a side switch for this surplus. The inspector takes a basket from the main line or the switch, slides it on to a low table provided with rollers on the top and moving on a rail on the floor, which she pushes before the compartment of the inspection table reserved for each order. Here she takes out each article, verifies its identity, the quantity and the price, and when all is finished, leaves the lot with the order ready for the packers on the other side of the table.[4] In case of error, she telephones to the preparation, where the message is received by a loudspeaker. Articles to be sent back to the preparation, or to come from the preparation to the inspection, are transmitted by an overhead lamson basket. The empty basket trucks are returned by gravity to the preparation.

The operation of this system is clear from Figure 1. The photograph, Figure 3, which is taken from another installation not so mechanical, shows the inspector with her basket on one side of the table. On the other side of the table, as seen in Figure 4, are the packers. It will be seen that the packers are provided with low tables on which to pack cases, and with higher tables (which in the original installation folded back under the inspection table) for packages. Overhead are rolls of papers of two standard sizes and qualities. Above and opposite are standard shipping cases. On the floor is straw for packing. In the case shown in the photograph, packing cases are themselves baskets. In the original installation we used collapsible wooden cases, in three dimensions, of such a nature that, when emptied by the branch managers, they can be folded and returned with the minimum of freight charges.

The packed cases and packages are placed on the gravity rollers, whence they descend to the shipping clerk, as in Figure 5. There they are weighed and the necessary documents made out, including the card record of individual cases on which the history of each collapsible case with all its voyages, repairs, etc., is kept.

Reforms in the grocery stores rooms and the entire accounting department (in which the accounting for all the branches is done) were equally radical and gave equally good results; but it would go far beyond the limits of this paper to describe them.

In closing, I wish again to call attention particularly to two features of this organization. First, standard bins are used from the reception clear through to the issue of merchandise. Second, the organization of the stores room is in two groups—reserves and preparation. These two features, which I have not seen employed before or elsewhere, are responsible for very great economies, and fortunately they can be applied in a wide variety of commercial and industrial establishments.

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[4] To display the order in such a way as to facilitate inspection I used specially constructed truck platforms of duraluminum in the grocery department. The trucks had forty-eight shelves; they weighed thirty-five pounds and were capable of transporting five hundred pounds of merchandise, an average large order. Each shelf has a wooden tray open at the top and at one side and in each tray are the contents of one line of the order. These trays pass on a specially constructed gravity roller table before the inspectors and packers. When they are emptied they are returned by gravity under these same tables to be replaced in the shelves preliminary to the filling of new orders.

European Industrial Tours

NOTICE of two interesting industrial tours in Europe during the coming summer have just come to our attention.

Professor Henry R. Seager and David Ostrinsky of Columbia University are planning to take a small party of economists into Russia from Germany early in July. Besides Moscow and Leningrad they will visit industrial developments along the Volga and in the Don Cossack and Kuban sections. They plan to reach the Soviet-Polish border about August 13. At least one Russian-speaking American will accompany the group. Those interested should get in touch with Professor Seager.

The Research Bureau for Retail Training of the University of Pittsburgh is also planning a tour which will be of special interest to those interested in the field of retailing. The group plans to leave New York by S.S. "America" on July 2 and to arrive back in New York on August 22. The itinerary includes Stockholm, Berlin, Prague, Vienna, Paris, and London. Opportunity will be given to attend the Passion Play at Oberammergau. Address Mr. Gordon Grant, Associate Professor of Trends in Retail Store Management, for details.

Productive Overcapacity

Its Extent, Causes and Economic Significance in American Industry Today

By LEONARD KUVIN
Economist, Index Number Institute, New Haven, Conn.

THE IMPORTANT question of excess of industrial investment capacity has been discussed from various angles and at various times by engineers, economists and business men. In all cases the general underlying theme upon which there is agreement is that in one way or another American industry is, in a large measure, overequipped. Rarely are estimates provided as to the extent of such overequipment. Reasons are ventured only incidentally for the existence of this condition of unused, potentially productive machinery and equipment. In few cases is the question granted careful consideration with respect to its economic significance. The problem is an extremely vital one in an industrial society breathing its life from a state of mechanization. It should be treated as a problem in its own right.

The reasons for industrial overcapacity may be classified as being either basic or immediate. In a profit-making economy, industry produces only a fraction of what it can and should, basically because industry as a whole cannot dispose of its entire possible output of goods at a profit. The selling price of goods under such conditions of overproduction would obviously be insufficient to compensate for the risk of capital investment. The demand for goods, springing from the purchasing powers of markets at home and abroad, is of necessity insufficient to force all available plant and equipment into use.

But the industrial economic structure of industry in a profit-making economy is so conceived as to function and operate under these conditions. In other words the condition of unused, potentially productive powers may exist for years on end without seriously and permanently jeopardizing the many forces that bring the condition about. In a sense a state of unused capacity must exist under conditions of competition and free enterprises. What can be changed is the magnitude of such idleness of equipment. That this is true might be gathered from immediate causes responsible for this industrial condition; that it is very important will be seen from the data available.

Facts on Industrial Overcapacity

In their questionnaire on manufactures in 1923, the Bureau of the Census included two questions intended to throw light on the total value of goods manufactured and on the total possible value of goods that could be manufactured provided there were sufficient sales and provided plants worked at maximum output. These questions were answered by accountants, controllers and other individuals interested in the monetary side of productive output. It is needless to say that the measures derived from these figures show a much too favorable condition of operation of American industries.

They are, however, the best data at present available describing actual and capacity production in a comprehensive manner. No serious efforts have been made in the past to measure the relative amount of industrial capacity that is unused. The 1930 census promises better data. The questionnaire for the 1930 census does not ask for monetary value of goods manufactured in attempting to determine the value of goods and its bearing on actual and total possible outputs. It deals with the total amount of horse-power used in relation to the total possible amount that could be put into operation. These figures will be engineering data and will be fairly accurate and representative of conditions of productive output. We shall then have a better idea of the extent of unused equipment in various industries. For the time being, we must be content with the data already collected. But in using them we must be careful not to overestimate their importance or accuracy, nor must we indiscriminately lump various magnitudes, representing values of manufactured goods, in order to get a comprehensive view of conditions in any one branch or group of industries. The prices of goods are a large factor in values and will exert unnecessary influences on such computations.

A good method of dealing with these detailed data of actual values and total possible values of output is to get the percentages of actual to total possible values and then to group them under their proper industrial classifications, applying the various percentages to the primary horse-powers known to be available in the respective detailed industries. In doing this we multiply primary horse-powers by percentages and get for the different groups of industries hypothetical figures which appear to represent the actual primary horse-power in use. This is accomplished under the assumption that the ratio of actual to available horse-power is the same as the ratio of value produced to the total possible value that can be produced. The assumption is, of course, false; but if we desire to introduce the element of horse-power into our computations, using it for all it is worth, we must make it.

Totaling the hypothetical actual horse-powers in use in the various groups and referring them to the total available horse-powers in the same groups, we arrive at the best possible estimate we can at present compute of the horse-power in use in various industries. The results obtained by these computations are illustrated and tabulated in Figure 1. It will be observed that in 1923 the capacity used varied between 57.4 per cent for the food and kindred products industries and 89.6 per cent for the paper and printing industries. The productive capacity in use of all industries averaged 74.2 per cent for 1923. Similar computations for the year 1921 showed fluctuations of used capacity between 43.7 per cent in the transportation equipment industries and 80.1 per cent in the railroad repair shops industries, with an average for all industries for that year of 61.3 per cent.

We observe two things. One is that there is a considerable range of idleness in various industrial groups; the other is that there is variation from year to year of idleness in the several industries. We cannot draw too broad conclusions from these observations because of the inadequacy of the data. We can, however, conclude that industry working even under the eight-, ten- and twelve-hour shifts is working under conditions of decidedly limited output.

Estimates based on the experience and observation of several individuals show less favorable industrial operating performance records. Thus, it is held that the fine paper industry functions at an average of 79 per cent of possible production. The flour milling industry performs at 40 per cent of capacity; the oil industry at 76 per cent; the manufactured gas industry at 50 per cent; the steel industry at from 60 to 80 per cent of total productive capacity and the machine tool industry at 65 per cent of its total possible output.

In 1922, when the Bureau of the Census undertook to estimate the total wealth of this country, it was found that the value of the manufacturing machinery, tools and implements was about one-twentieth of the value of all land, materials and equipment of all sorts in this country. In money terms it was estimated that manufacturing machinery, tools and implements amounted to 15.8 billions of dollars, while all the values in this country amounted to something like 321 billions of dollars. When we reflect that in 1900 these values were 2.5 billions and 88.5 billions respectively, we

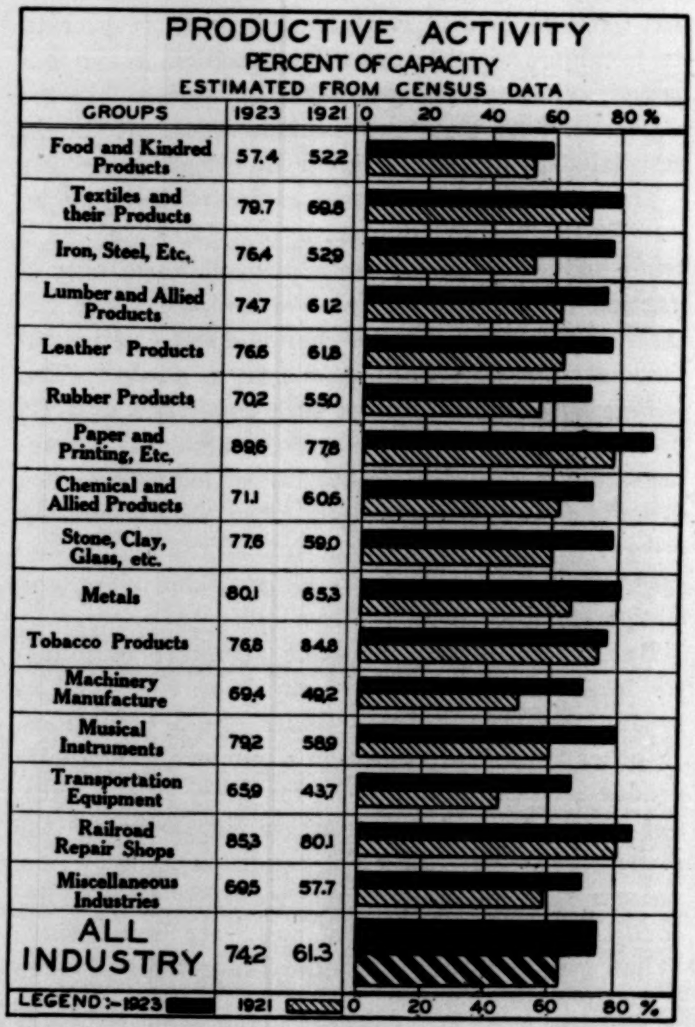

Figure 1

observe that the value of manufacturing machinery and equipment multiplied six-fold while the value of all goods and valuable materials multiplied less than four-fold. As society becomes increasingly mechanized it is reasonable to believe that the proportion of manufacturing machinery, tools and implements to the total national wealth will become larger.

Even now the investment in industrial production is tremendous. The magnitude of railroad and equipment facilities was close to 20 billions of dollars in 1922 as against 9 billions of dollars in 1900. The transportation industry, however, has gone through its era of expansion. We must realize that mechanization of industry in the future will play a dominant role in the economics of our existence. These facts are brought out to indicate that the capital investment involved in idle equipment and machinery is gigantic and promises to play a dominant part in the material welfare of our future.

Comparing census figures of the goods manufactured in 1927 with the value of farm products in 1926, the latest available figures, we find that there were 62.718 billions of dollars of manufactured materials as compared with 12.985 billions of dollars of farm products. In other words, the value of manufactured goods in this country is about five times the value of farm products. Of these 62.718 billions of dollars the total value added by manufacture amounted to 27.585 billions of dollars (see Figure 3). In other words, more than one-third of the total value of manufactured goods was imparted by the manufacturing process.

It is little wonder then that a small percentage change in the magnitude of idle equipment is of such tremendous importance to the economy of the nation. Yet in spite of all this, no serious efforts have ever been exerted in the past to measure, let alone solve, the magnitude of such an economic evil.

Reasons and Factors

The problem may perhaps be solved by a series of approaches. If a basic evil cannot be dealt with the intermediate factors which bring it on may be perhaps entirely eliminated. To do so, some basic mechanism might be conceived and utilized. It might be well therefore to examine some of these factors.

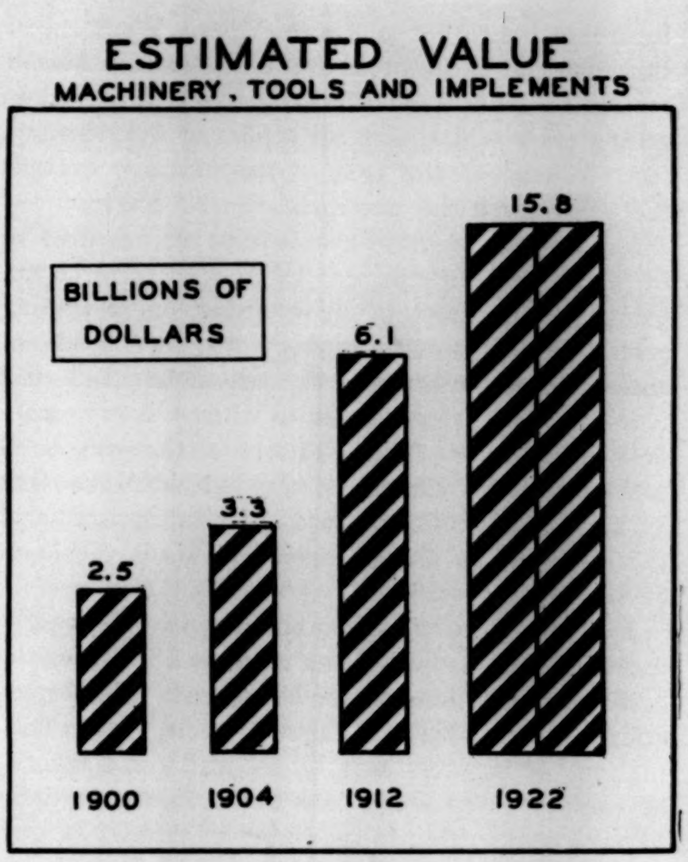

Figure 2

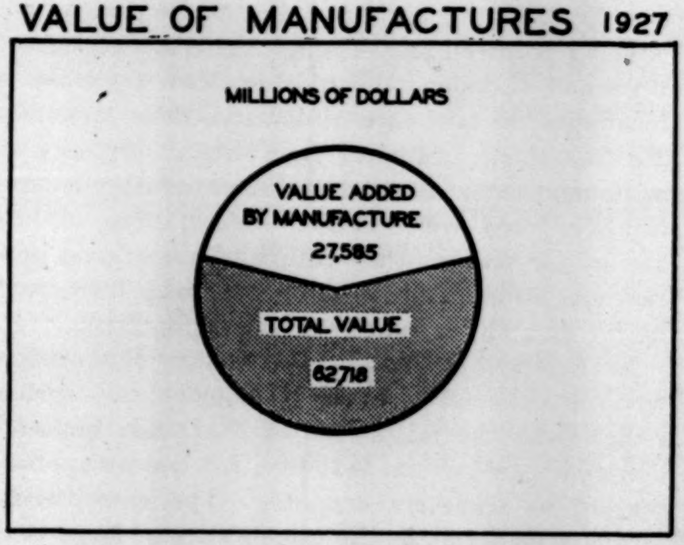

Figure 3

1. *Risk of Loss.* One very important inhibitor of full productive power is the risk of loss. Enterprisers may even be willing to turn out large volumes of business at low profits; but they are unwilling to operate in this fashion if there is a

moderate indication of possible loss. With only a thin margin of profit above costs it is a simple matter to deduce that a rise in costs or a fall in selling price will absorb all profits or even incur a loss. Whenever the cost of manufacture exceeds the sales price the enterpriser faces disaster.

Movements in price are beyond the control of the individual enterpriser. While he may be capable within limits of maintaining or regulating prices in definite and highly integrated fields of enterprise, for instance in the automobile and steel industries, he is powerless in almost every other field of endeavor. The gyrations of the price level are beyond the control of the individual concern or even groups of concerns. The enterpriser is at the mercy of an unstable price. This is the basis of his fear of loss.

2. *Peak Demand*. The amount of idle equipment in an industry is often governed by the peaks and troughs of demand for its output. The fluctuations of the industry's business cycle, or the fluctuations of business as a whole, call for a reserve of equipment to stand idle in readiness partially to meet competition in supplying additional output.

It is held in some quarters that the fact of setting up equipment for peak loads accentuates the so-called business cycle and creates the peak which is being prepared for. Though there are periods of time and occasions when equipment available is insufficient to take care of demand, these instances are less often and rarer than when surpluses of equipment exist. Though the steel industry is continually faced with unfilled orders, these orders are set for a time in the future. That a good portion can all be filled in the present may be proved by the data on per cent of actual to possible output.

3. *Retarded Demand*. The inability of a market to absorb the full product of industry may spring either from the magnitude of the price, business depression or general inability, for one or another reason, to stimulate demand. The enterprising business man weighs the possibilities of large output at a lowered price, yielding in the aggregate a larger profit than a limited output at the market price. The number of men who reason as does Ford, for example, who operates his plant at full capacity and efficiency, lowering costs and sales prices and creating demand, is unfortunately limited. This is one factor in maintaining industry in partial idleness.

Demand is also limited by the fact of a business depression. At the trough of a cycle the market is glutted with goods produced in the distant and recent past and awaiting sales. Demand is stifled and prices drop. Production cannot proceed economically for a time. Equipment must remain idle.

Another source of idleness traced to markets is the general inclination of business men to believe that the demand saturation points may have been reached. Such producers, by training and inclination, consider the operation of plants at reduced efficiency normal because they have known only such a condition in the past. Theirs is a general complacency which prevents their discovering markets before their very eyes at home as well as establishing outlets abroad.

4. *Increased Efficiency of Machinery and Plant*. An excess of capacity is being continuously built up by the introduction of newer and improved machinery and plants. Inventions and developments in the technological arts never cease rendering equipment and plant partially or entirely obsolete. The processes of competition require the weeding out of the less efficient. Nor do these less efficient plants exist only because of improvements in the sciences and arts.

There is an incalculable number of enterprises whose only original purpose of incorporation is to squeeze into some nook or cranny of the business world. Large-scale business is engaged in a war with such firms. The efficient smaller firms survive and grow while the inefficient waste away and add to the store of unused capacity. Old plants replaced by the new are held for possible future returns to owners.

5. *Inefficiency of Labor*. In the absence of complete automatization of machines considerable responsibility for the volume of output rests on both the employe and the manager of an industry. If either or both are impressed with the fact that their efficiency will glut the market, self-preservation will tend to reduce output. The laborer will choose full employment and partial efficiency against partial employment and full efficiency.

Though this obstacle to production often disappears with the introduction of completely automatic machinery and the application of principles of scientific management, there still remains a fertile field for its operation in small industries and in those industries where the idea of glutting possesses the employers.

Most often it is the entrepreneur who is responsible for such inefficiency of labor. It is he who allows things to drag along while he labors under a timidity preventing him from going forward in production.

6. *New Enterprises and Failures.* A prolific source of unused equipment is the steady influx of new enterprises into the field along with the growth of demand for goods and rises in price. New enterprises are incorporated whenever business conditions are favorable.

The number and size of business failures both increase with the increase in new incorporations. Failures mean the pouring into an industry's reservoir of a large quantity of equipment which is doomed to remain idle until the tide turns. The businesses that fail are the least efficient, and it might be argued that the percentage of equipment in use should rise in the end. This would be true if the new inflow of equipment were not more than necessary to meet the new demand over and above the demand which is met by reserve capacity.

7. *Unstable Price Level.* An unstable general price level is another cause for the existence of idle equipment. It has been mentioned along with the influences of new enterprises and failures, risk of loss, lack of markets and peak demand.

These influencing conditions stand in relation to an unstable price level as immediate and direct forces to a basic underlying force. In other words, a changing price level is responsible to a large extent for the influx of new enterprises and the failure of many, new and old; it is responsible in a large measure for the risk of loss and it is a powerful agent making for the ups and downs of the business cycle.

Economic Significance and Conclusion

When we review these reasons, we are apt to think the solution to the problem impossible or even unnecessary. Such an opinion is presumably based on some knowledge of the financial and economic features characteristic of the condition of overcapacity.

One thing certain is that the cost of ownership of unproductive enterprise is borne directly or indirectly by the consumers of goods. The cost of new or improved equipment is taken care of through accounting practices which involve either the augmentation of the plant and equipment account or the writing off of displaced equipment through the depreciation and obsolescence accounts. In one case the consumer pays for the cost in the element of fixed charges while in the other he pays in the element of depreciation, both overhead items entering into the cost of manufacture. In either case, when capital equipment does not produce the cost of misplaced capital the investment is borne by the consumers. From the standpoint of consumption the significant thing is that these excess charges wrongfully deprive consumers of an increment of purchasing power and tend to stifle demand for industry as a whole. From the standpoint of productive endeavor funds are misdirected into channels where proper use is not made of them. Both evils are deplorable. A retardation in the normal growth of living standards and a postponement in the train of civilizing events which always follows from such higher standards are the heavy price which society pays.

And yet there is no real reason for this limiting of our productive powers. Engineering materials, knowlegde and the energy to produce are our heritage. All we need is the courage to apply ourselves to newer economic devices to bring about the social advances quite within our power to achieve. The problem is one more of economics and finance than of engineering. Just as soon as the American people undertakes the task it shall solve this problem and open the way to a nobler and richer material life.

IN THE latest of the sciences to be developed, that which deals with the art of living in communities, what is required is not only a perpetual widening of the social purpose of the people as a whole, but also a larger and larger measure of foresight, invention and technical efficiency in the specialized groups of brain workers on whom, for the most part, the execution of this social purpose will necessarily devolve. (Sidney and Beatrice Webb, *English Poor Law History,* p. 1023.)

Standardization[1]

Some Considerations Concerning Its Development and Practice in American Industry

By JOHN GAILLARD
Mechanical Engineer, American Standards Association, New York

AMERICAN industry may claim to have been the most important factor in the advance of mass production and therefore in its indispensable instrument, standardization. Eli Whitney's manufacturing more than one hundred years ago of 10,000 muskets of interchangeable parts has become a classic as an early example of standardized production. Taylor's principles of the analysis of methods of work, and the standardization of all of the elements having an influence on it, are recognized throughout the world as the basis of sound management. To "Fordize" a plant is now a current expression for the extreme in so-called continuous flow production, a system which originated in the packing houses of Chicago, and was converted from progressive disassembly to progressive assembly, to suit the purposes of the automobile and other industries. Without far-reaching standardization, the astonishing achievement of manufacturing 7,200 automobile frames a day, with only 180 men—as a plant in Milwaukee is now doing—would be inconceivable.

The importance of standardization in national economic life was duly recognized by a number of prominent engineering societies which in 1918 founded the American Engineering Standards Committee to promote the principles and the application of standardization, and to co-ordinate the national work. In 1928, this body was reorganized under the name of American Standards Association along broader and more flexible lines as regards scope and procedure. One of the matters on which it will spend considerably more effort than it has been able to do so far is the introduction into practical use of standards after they have been approved as American Standards. This is bound to promote also the adoption of standardization as a distinct managerial function in organizations which have not yet given this matter sufficient attention, and such a change in the attitude of an organization is essentially more important than the adoption of the standards themselves.

Assuming that this particular phase of the national standardization movement would interest the members of the Taylor Society, it seemed proper and useful to present to you a few aspects of the problem which we are facing. Before proceeding, may I state that the standardization work referred to here is of the "engineering" kind; that is, it deals with technological rather than with managerial matters, although the latter phase may be said to be very closely approached in character in the safety code work, which itself forms quite a program, in the activities of the American Standards Association. In fact, there is no strictly defined boundary between specifications of what should or should not be done from a technical viewpoint, and standards having a purely managerial character. At present, however, problems relating to the establishment of standing orders, to time and motion study, to cost accounting and to other divisions of scientific management in which the establishment of standards is indispensable, are not dealt with by the Association. There is so much to be done in the field of standards of nomenclature, dimensional standards, standards of quality, rating, testing, safety measures and recommended technical practices—to touch the high spots only—that it would mean a scattering of effort, with a consequent lack of efficiency, to enter now the fields more remote from what is commonly understood by "engineering."

To return to the subject of promotion of the use of standards in business organizations, such promotion may be undertaken along two different lines. Organizations in fields covered by certain existing standards—more particularly national—may be approached with an inquiry as to whether the standards in question have been adopted. If this should prove to be the case, valuable comments resulting from experience with the standards may become available to those responsible for their formulation. Incidentally, this experience should be recorded with a view to a possible revision of the standard at a later date. If, on the other hand, the standards have not been adopted, it may prove interesting to investigate why this has not been done, and a discussion of this question will probably also lead to a valuable exchange of information. For example, the reason given for the non-adoption of the standard may be limited to the statement that lack of demand for goods produced in accordance with the standard withholds the management from considering its adoption. Or the general view may be expressed that, while standardization may be a very useful thing in other branches of industry, the requirements of the particular trade in which the organization in question is engaged are too special to render advisable the application of such methods. I need not tell you that this latter view usually proves incorrect when the situation is duly analyzed.

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[1] Paper presented at a meeting of the Taylor Society, New York, December 5, 1929.

The other method of promoting the use of standards, although less direct insofar as the promotion of specific standards is concerned, is more fundamental because of its more general approach. It starts from the basic question: "Is standardization consciously used as a tool in the organization's management, to the extent that there is a special department keeping track of all possible opportunities to crystallize into company standards the experience and requirements of the various other departments?"

In most cases this question would seem to be an almost superfluous one, especially if one keeps in mind the special merits of American industry in the field of standardization referred to a while ago. Therefore, doubt may naturally arise as to whether it should not be assumed that the large majority of individual units of which American industry is at present composed tacitly considers standardization as an essential managerial function.

We know, of course, that a number of organizations in this country are in possession of a very valuable collection of excellent company standards, which are established, kept up to date, and constantly supplemented by a regular standards department or division. However, looking at the situation from a wider angle, we shall find it still more interesting to investigate how thickly standardization as a managerial function is spread over industry at large. Indeed, such investigation will lead to rather unexpected conclusions. According to the most recent statistics available in the Bureau of the Census in 1925 there were in this country more than 187,000 manufacturing establishments, of which more than 10,000 turned out products valued at $1,000,000 or more. For the purpose of this study, and to avoid any possible difference of opinion as to how large a concern should be to have a regular standards department, let us concentrate our thought on these larger establishments. In fact all of you will agree, I believe, that any concern of such size, whatever its business, can only benefit by having a standards department, or rather that, from the standpoint of efficiency in management, it cannot afford to be without one.

Assuming then that we would expect at least 10,000 American manufacturing concerns to have their own standards departments, let us now try to find out what the actual situation is. Unfortunately, no statistical data are available in this respect, as far as we in the American Standards Association know. It may be said, however, that during the eleven years' existence of this body, its office has not been able to list more than 70 to 80 companies having their own standards departments, in spite of the fact that a special effort was made, by personal inquiry and by correspondence, to trace such concerns. In this respect, I may refer not only to the experience of the office of the American Standards Association, but also to the results of the study made by Dr. Robert A. Brady in connection with his work in drawing up a comprehensive report on "Industrial Standardization" for the National Industrial Conference Board.

If, then, we bring the number of companies having standards departments up to 100, and if we still assume that we know only half the truth, although it sounds incredible that a concern producing a million dollars' worth of goods per year and having a standards department would never have had occasion or reason to get into contact with a central body like the American Standards Association, we find that only 2 per cent of the larger organizations considered here are giving standardization the chance it deserves from the standpoint of scientific management. To anyone making a study of standardization and its effects on such functions as purchasing, engineering, production, distribution, etc., this is a most surprising fact. It is somewhat as though only a few of our larger concerns had as yet discovered the existence of labor-saving machinery, not physical in this case, but mental.

Let us look for a moment more closely at the function of purchasing, for instance. Do purchasing agents buy the commodities needed by their concern on the basis of standard specifications in every case where this is technically feasible? In 1925 the U. S. Bureau of Standards in Washington, D. C., published a "National Directory of Commodity Specifications" listing about 27,000 standard specifications used in this country by private firms, trade associations, technical societies, public authorities, etc. Even though this list contains many duplications—a number of individual specifications have been adopted by more than one organization—it looks rather impressive at first sight. When one learns, however, that a single electric power company—a large one, it is true—has found that no less than 41,000, or 89 per cent, of the 46,000 items which it regularly purchases are suitable for standardization, a somewhat different light is thrown upon the 27,000 figure, even though our appreciation of the good work done in compiling the list is not diminished. In fact, on 28,000 items, that is, on a number larger than that listed in the National Directory, standardization work had been started some time ago by that company.

In the light of the above facts, it must be concluded that the renown of American industry in the field of industrial standardization is evidently due to the outstanding achievements of a relatively small number of organizations, rather than to the general acceptance by the average concern of standardization as a business or managerial policy.

A further question must therefore inevitably arise in one's mind; namely, what are the obstacles which may prevent standardization, so actively preached in many quarters and given so much attention in the various technical magazines and even in the daily press, from being more generally adopted in individual plants?

I have listed a number of the obstacles most commonly met.

1. There may be a complete lack of interest in the possibilities of standardization due to the fact that the business is running to the satisfaction of the management, and that there are no apparent flaws suggesting potential trouble. Under these conditions, the main aspect of a possible change may seem to be one of needless outlay of capital and non-justifiable disturbance of the existing course of affairs, without a fair chance of increased returns. Such an attitude explains the fact that the advocate of standardization often finds a more attentive hearing in times when business is slack than when it is flourishing.

2. Pride of existing traditional practice may prevent the adoption of a new standard, either because the quality of the product made by the concern in question is deemed superior to the standard specifications or because a certain type, style or brand has captured the market to a considerable extent. In the former case, the company may also fear that the large majority of consumers will be satisfied with the standard grade and that consequently the higher grade may not command the accustomed rate of profit. For those advocating the adoption of the standard, this is usually a rather difficult question to argue about, because a concern that pays no attention to standardization will as a rule not have any system for keeping track of market conditions enabling it correctly to judge future sales possibilities.

3. It may be a question of who will be the first to fall into line with the standard: the manufacturer who wishes to continue to make the product that has become non-standard, as long as there is a demand for it, or the user who decides to buy the obsolete kind of product as long as he can get it without an increase in price.

A decision on the part of either group no longer to make, or no longer to order, non-standard product may break the deadlock to the benefit of both parties. Concerted action between the two groups is of course still better. Agreement between the two groups may be greatly facilitated by fixing a date on which the new standard shall go into force. Such date should be well ahead of the date of agreement, in order to allow for the clearance of old stock on the part of the producers, and for securing or using replacement parts for old equipment on the part of users.

4. A very common case is for everybody in the organization to focus his attention so completely on his particular function in the business (design, production, testing, etc.) as to have no time to consider possible opportunities for standardization. Even if it is realized that standardization would be beneficial to everybody's work, nobody has time to stop and think about it. Also, the problem may be so extensive and intricate that it cannot pos-

sibly be handled by the staff of one particular department which has no authority to get things done in other departments.

In this connection it may also be observed that the introduction of standardization as a function of management—like research and other progressive industrial techniques—demands a carefully and systematically prepared plan, carried out with great determination. A casual venture into the possibilities of standardization by means of well intended, but isolated efforts is almost bound to fail and to do more harm than good to the standing of the cause in the organization concerned.

5. Standardization in many cases acts as a tonic whose vitalizing influence appears not immediately but gradually. This may explain why an organization that is perfectly willing to spend $10,000 on a new machine, provided it will save its cost in a few years, may not feel inclined to put any money into even a modest standards department set-up, simply because the savings that it could effect are not so clearly evident in advance. Probably the best thing to do in this case is to recommend that standardization be given a try-out on an object greatly in need of it, and to refer, with data and illustrations, to cases where standards departments have proved to be excellent investments.

For instance, the sum of $10,000 a year was saved by a large machine tool manufacturer merely by eliminating odd varieties of bolts and nuts. It is evident that, although the investigation preceding this weeding-out process may have been a rather extensive one, it very probably required only a fraction of the amount saved in one year, while once the job was completed the saving continued. A company manufacturing textile machinery saved in the course of seven months three times the cost of the standardization work for the year. After having spent money on standardization for three consecutive years, another concern reported that, on the basis of the results obtained, it expected the investment to yield a dividend of 500 per cent in the fourth year.

6. There may be a feeling in the departments of an organization that each is well able to take care of its own business, and that there is, therefore, no special need for a new department, which by its very nature is expected to have a certain control over the activities of the existing ones. Thus, the departmental staffs will hold that nothing would be gained by pooling their respective requirements and experiences. This situation calls for particular tact and mutual consideration, something which is necessary, of course, in any kind of co-operative work, but certainly to a high degree in standardization, whose nature, it has been said, is 90 per cent a matter of human relationships and only 10 per cent a matter of technical problems. Moreover, if under such conditions, the establishment of a standards department is effected, it may easily become the victim of a continuous struggle for supremacy in its control, although in reality it should not be controlled by any particular department.

7. Too often a standard is still regarded as something rigid, resisting any change whatsoever, hampering progress and stultifying the state of the art. Having no standards would then mean, according to this view, complete freedom of action and progressiveness. This fallacy may be met by emphasizing the point that standardization does not mean standing still, but moving forward together in harmony; that no standard should be regarded as the one best solution for all times, and that, just as in the case of the regulator of an engine, a sufficiently important change in basic conditions will automatically bring about a movement of the whole system from its original position of temporary stability to a new one.

8. As the last cause of resistance to be listed here, I should like to mention a few factors which are largely due, I believe, to certain phases in the early development of the human race, when man, in order not to be wiped out, had still to struggle with the most fundamental problems of existence, such as food, clothing, shelter and defense. Under these primitive conditions he had to provide rough and ready emergency solutions for his crude problems and, while solving them, he was flooded with new ones, preventing the revision and refinement of the solutions of the earlier problems.

Man thus expanded for a long time in the scope of his activities and interests, but not in their depth or their intensive working out. When, in a later period, he began to specialize in distinct trades, the situation did not change materially. Forced to go ahead or drop out, and disposing by and by of a considerable amount of practical experience accumulated by many generations, the craftsman had no time to look backward and find out whether the problem had been solved in a fundamentally correct manner from the outset. Nor was there any apparent good reason why he should do so. Humanity had already acquired more or less the habit of guessing and of cutting corners to speed solutions, and moreover, there happened to be a certain venturesome charm in such procedure. Therefore, it took man a long time to free himself sufficiently from the immediate needs of life to apply analysis and measurement, followed by synthesis. In other words, it was a long time before he came to see research as a distinct function. And, after all, standardization at its best is the storing away of the precious results of experience, of which research is a highly intensified form.

I shall illustrate this by a few examples. A very large organization in this country is now engaged in a study of the basic principles underlying the function of the wheel in contact with the ground. How many thousands of years had to go by before this scientific analysis was started, since —who can say by what laborious method—one of our remote ancestors, desirous of improving transportation, started to cut slices from the trunk of a tree? And how much progress did brick masonry make, since the achievements now being studied by the archeologists in Mesopotamia, before Gilbreth dissected bricklaying practice by means of an intensive motion, time and fatigue study and reassembled its elements into a method which is now held up to the world as a brilliant example of pioneer work in this field? Not that his method has now been generally adopted by that same world; it is evidently still too far ahead of conventional methods. A technical committee appointed by the American Standards Association is now studying the establishment of a "Code of Good Practice for Brick Masonry," an interesting development in an art known to be more than 6,000 years old.

Coming back, then, to the manner in which human skill in the trades developed along parallel, but often isolated, lines we are not astonished to find that in more recent times, say after the introduction of steam power into industry, it was found extremely difficult, if not sometimes impossible, to straighten out the discrepancies between fundamentally identical practices which had grown up independently in different industries, even though there was created an increasing desire, based on necessity, to do so. Even now specialists in various lines frequently do not feel much disposed to bridge the gap between their conventional solutions of the same problem. As bearers of practical progress in their respective trades, they have pushed so far ahead into the unknown regions stretching out before them that they have been unable to maintain the lateral contacts and the interpenetration of ideas necessary for the regular advance of a duly coordinated general front. Men of their type have been pushing the art of their particular trade so forcefully that they are now being pulled along by the requirements of their art, or its tradition.

This phenomenon is found all along the line, from the broader division of work into trades, as exemplified in the several branches of a large organization, to the more subtle division of work in an individual plant. For example, each of five first-class railroad companies, located in one of the large railroad centers in this country, requires twenty-five to thirty sizes of steel tubes to cover its needs. There is so much diversity in the requirements of the individual companies, however, that a tube mill which supplies all of them is obliged to carry more than one hundred sizes.

One concern found that about one thousand different miter gears for driving two shafts at right angles at a 1 : 1 ratio had been developed in the course of time. Although the discovery may have been somewhat of a shock to the management, it must have experienced a feeling of reassurance that after all it was now finding out flaws of this kind and could save money by eliminating them. No doubt other concerns will find similar opportunities for savings, provided they are also willing first to go through similar shocks.

The ability of leaders to push ahead on the strength of their vision and good judgment, where experience and data are still lacking, has quite naturally become one of their main characteristics. No wonder then that the born leader, whether he be called an executive, manager, superintendent or foreman, will himself put more value on his ability to cope with problems for which no standard solution has as yet been found, than on his capacity to deal with those problems which have been captured by analysis and experience. This explains, I believe, why this type of man is likely very often to find the problems of standardization devoid of interest, and consequently to pay only scant attention to the machinery evolved to deal with them.

However, if the standpoint of the "born leader" is correct, that management is an art whose greatest intrinsic value lies in the ability of the executive to judge non-measurable conditions, then there is no better argument for the thesis that every executive should consider it his duty to adopt, introduce and enforce the use of standards as a means of enabling him to concentrate his energy more intensively on exactly that part of his function in which he takes the greatest pride and which he deems most indispensable, as it cannot be supplanted by systematization. I have never seen this more beautifully expressed than in a paper written by Mr. A. W. Whitney, former president of the American Standards Association, in which he says:

"Standardization is the liberator that relegates the problems that have been already solved to their proper place; namely, to the field of routine, and leaves the creative faculties free for the problems that are still unsolved. Standardization from this point of view is thus an indispensable ally of the creative genius."

The executive should, moreover, bear in mind that apart from the managerial aspect, the practice and economy of production obviously require temporary constancy of a number of factors in order to prevent technical and commercial problems from becoming a series of equations with too many unknowns, leaving too much to guess. It might be put in this way, that the upward slope of industrial progress can be scaled only by providing, between flights of steps, platforms in the form of standards where one can take a moment's rest, look around to survey the new situation and gather energy for the next partial ascent.

The establishment of a standards department in an organization does not necessarily mean a costly set-up of a large-staffed division. It may be started on a modest scale, perhaps with the services of a single man, and gradually expanded when the movement grows and branches out.

An essential point, to be carefully observed, is that the standards division must be free to tackle the problems of co-ordination between the several departments without having to give special consideration to any particular one of these. If it is to be the ward of some other branch of the company, however well organized and managed the latter may be, and however co-operative its intentions, there is little chance of success. The principles incorporated in the charter of the standards division should involve consultation with, service to, but independence of all other departments.

My purpose in presenting this paper has been to establish some kind of basis from which we may measure, or at least reasonably estimate, the degree to which standardization has actually become the habit-forming instrument of American industry in general. The results seem to indicate that there is still an enormous task before us, whose accomplishment will, however, be greatly facilitated by the contributions made to the technique of standardization by those concerns which have already gone deeply into it.

The American Standards Association occupies a privileged position in this problem. Founded with the idea that it should become the center of national standardization work in this country, and the authoritative channel for international co-operation in such work, it is excellently equipped to lend its assistance to any concern that has placed, or wishes to place, standardization on the list of its managerial functions. Realizing that to do so, in addition to promoting the establishment of national standards, is a matter of the highest importance, the American Standards Association stands ready to put its experience, and the data available in its files, at the disposal of any concern that may care to avail itself of them.

In conclusion, let me say a few words about the international situation. During the last twelve years, there has been a tremendous increase abroad in the attention paid to standardization from the standpoint of national economy. At present there is a national standardizing body in each of twenty-one countries.[3] These bodies not only regularly exchange information on projects completed and in course of development in their respective countries, but there was also founded in 1928 an International Standards Association, whose office is in Zurich, Switzerland, for the purpose of facilitating and systematizing this exchange of information. It also works to eliminate discrepancies between national standards on the same subject wherever this is desirable and feasible. The benefit derived from such international co-operation by each country will largely depend on the degree to which its national machinery for performing standardization work has been developed. And the amount and quality of the standardization work of any particular country will have a significance in the markets of the world similar to that of the machine equipment of an individual plant; that is, it will in many cases prove the decisive factor in competitive effort.

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[3] Australia, Austria, Belgium, Canada, Czechoslovakia, Denmark, Finland, France, Germany, Great Britain, Holland, Hungary, Italy, Japan, Norway, Poland, Roumania, Russia, Sweden, Switzerland and the United States.

Foreign Appraisals of "Recent Economic Changes"

A French Opinion[1]

By CHARLES DE FREMINVILLE
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THOSE changes in the field of economics which have recently brought about an extraordinary development of industry have been made the subject for a great deal of study by all of those who feel anxiety at the increase of wealth in their country, especially as it affects social equilibrium. Therefore, the "Report on Recent Economic Changes," which was sent to us immediately after its publication in the United States by our excellent friends in that country, was received with most spirited interest. We instantly saw in it a document of exceptional importance, not only because of its immediate utility, which is apparent, but also because it marks a considerable progress in the evolution of the science of economics. This science has played a rather passive role in pointing out too late the errors of the past, and has manifested an exaggerated confidence in the establishment of an equilibrium between the different elements of production and consumption. Today it must assume an entirely different attitude and clear the way by calling on the analytic methods of the engineer. These are indispensable in defining the points on which statistics should be gathered and in showing the value of the resultant figures.

The United States is the country in which industrial development has assumed the greatest importance. It is likewise there that changes in essential factors in the life of the country have made themselves felt with so great intensity that a co-ordination which had never before been secured has been necessary. It is not surprising either that the importance which must be attached to the study of these changes attracted the attention of that eminent statesman, himself an engineer, who already knew how to approach the vital problems of waste and unemployment with breadth of vision, by making use of the positive methods of the engineer.

How clearly we recognize in the spirit which actuated this inquiry the influence of the movement in favor of scientific management, with which the works of Frederick W. Taylor have already made us familiar. Thus, we think it quite natural that the Taylor Society should have taken the initiative in gathering together opinions on this work from the different countries that had already manifested an interest in the scientific management movement.

We should have wished that the appraisal of such an important work as the "Report on Recent Economic Changes" could have been formulated by a leader of French industry or one of our great economists. Since that was not possible, we must be content to give the opinions of an engineer who has followed the scientific management movement for a long time and who preserves faithfully the memory of his relations with Frederick W. Taylor.

The manner in which the inquiry was conducted is remarkable in many respects. First, it was prepared in an astonishingly short time. It is very evident that a study which deals with economic conditions in a country which has developed with unprecedented speed could have had no value if a conclusion had not been reached in a short time. One is amazed at the result when one considers that this inquiry, though it embraces all the aspects of the question, more completely than any other study ever made, was commenced in January, 1928, and completed in February, 1929.

The division of work between the Commission and the National Bureau of Economic Research was in order to check those who might wish to inject their ideas into an inquiry of this kind. The help of the National Bureau of Economic Research is important not only because of the number of competent men who participated in it but because of the way in which the documents were collected and presented, without any assumptions and without giving the impression that the material had been gathered to support a thesis. And yet one feels that in every instance all the important factors have been taken into account—technical, financial, human, moral, social, economic, and so forth.

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[1] Translated by Helen A. Carnes and P. E. Henderson.

The report of the commission presents in an enlightening manner the relative importance of the different elements of the problem which the inquiry brings out with so much precision.

The development of industry is proceeding with such rapidity, bringing with it consequences of such importance, that even the best informed business man cannot quickly pick out the line of conduct which he should follow. The problem goes beyond the limits of one business, or even of one group of businesses, and becomes a problem of national importance. And not only is it a national problem, but an international one as well. If economic science is to provide the solution, it must make new progress and perfect methods for setting up and examining statistics of manufacturing from which one can draw practical conclusions in time to make use of them.

For us the method by which Taylor approached the study of the worker, the principles of scientific management which he evolved from it, his vision of the economic and even social consequences which would result, were the first precise indications of the way in which the problem of the development of industry should be attacked. This development manifested itself before attaining extraordinary proportions and could not have been continued except with the perfect co-ordination of effort of all those who were called to contribute and the development of a spirit of collaboration which had so far seemed non-existent.

As early as 1911, M. H. LeChatelier had a very clear vision of the place that the application of the principles of Taylor should assume in the evolution of industrial economy. He concluded his preface to the *Principles of Scientific Management* by Frederick W. Taylor with the following:

"The steel manufacturers and the engineers are incessantly in strife with their clients, the railroad companies. They do not agree easily on sales prices, upon rates, nor upon commercial questions where their interests are opposed. This, however, does not keep them from recognizing that it is to their mutual interest to improve the qualities of steel, and they unite in technical congresses to discuss these common questions. They willingly fraternize on a ground where their economic interests are identical. Workers and employers could do as much.

"In a more or less distant future all these elementary truths will certainly be recognized. In that day the workers will no longer strike when new machines are introduced in their shops; rather, they will do this when their employers, too slow to follow industrial progress, do not permit them to increase their production sufficiently rapidly to make a better living for themselves. And they will not forget to demand an equitable share in the benefits of work done in common.

"Scientific management of work in factories, proposed by F. W. Taylor, is a realization of the essential ideas submitted here: It demands that the leaders of industry employ their science to multiply the productive capacities of their workers and that they offer, as remuneration for this greater production, an important increase in wages, not to mention the greater value given to money by reductions in the selling price of articles manufactured at a lower cost.

"But to attain this result, belief in economic determinism must first be made general; the law of enrichment by increase in production must first be made acceptable. This is now the battle to be won. *The physical sciences have increased the wealth of the world ten-fold in the past; the economic sciences will repeat the wonder tomorrow.*"

Many who have recognized from the beginning the accuracy and importance of Taylor's principles certainly never thought to see the realization of such a vision. Nevertheless it has not taken a great many years for these elementary truths, to which M. H. LeChatelier referred, to be accepted and put into practice, at least in the United States, and we are now taking part in a great forward movement in the economic sciences from which much may be expected.

It will undoubtedly be some time before the interested countries are in a position to conduct inquiries, on matters which concern them, similar to the one made in the United States. But this one has already instructed them in a precise manner on the relative importance of the different elements in modern industry and they can derive great benefit from it.

The development of industry in the United States has been studied on many occasions by foreigners, leaders in commerce and industry and by workers; but the information has always been gathered in too hasty a manner, in too limited fields, and has been influenced by personal opinion. It is thus that the different notions relating to standards of living, high salaries, mass production, distribution of products, credit, methods of work and the direction of co-operative efforts, have taken on, outside of the United States, more or less inexact interpretations and have prevented a true appraisal of the industrial problem.

"In order to understand the United States," said M. H. LeChatelier, (in his preface to the translation of "Elimination of Waste; Simplified Practice —What It Is and What It Offers"[2]) "it is not sufficient to examine actual performances in detail. It is necessary to study the basic and long-run causes of their success. Standardization as it is practiced today under the direction of the Secretary of Commerce is only the outcome of a long series of endeavors of which I propose to explain the origin."

This inquiry, as far as it has gone, throws a dazzling light on the conditions of industrial development in the United States—material, moral, social, financial, and so forth. And for foreign readers, the facts which it reveals will be useful in stimulating ideas on their own economic conditions. Of course they must take into consideration differences in natural wealth and even in national characteristics. As I heard it very aptly put by one of those who collaborated in the report, Mr. Henry S. Dennison, "The idea is not to implant the American spirit or the American state of mind in all countries, but to induce all countries to make use of the essential principles of scientific management, of the new science of economics, in order that they may take advantage of their resources while following the characteristics of their particular temperaments."

An Italian Reaction[3]

By FRANCESCO MAURO

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THOSE who conceived and carried through the studies on "Recent Economic Changes" have rendered a service not only to their own country but to the world in general. A great many of the contributions are even more important for those people who are thousands of miles away than for those in the United States. But the most valuable contribution of the report is the way in which it has freely placed all the ascertained facts at the disposal of everyone. Certainly this spirit on the one hand, and on the other the determination to interpret human conduct not only through the motivations of the instincts and the improvisations of empiricism but through the established techniques of science, are the most powerful elements in real progress.

This North American nation has moved forward with a rhythm without parallel in history. Even among the diagrams and figures of these two volumes one is impressed with expressions of dynamic power. They are not in the phrases but inherent in the facts themselves.

In greater or less proportions all European peoples have had their part in the formation of the North American nation. (I have deliberately omitted all reference to the negro problem.) It is essential that their contributions should be developed in accordance with a new pattern and not after the traditional European plan. The slate was washed clean of all ancient prejudices and hierarchical crystallizations of class—the attributes of centuries of old-continent history. The new country was not only extremely rich and fertile but hard as well. In the overcoming of the special hardships which it imposed qualities were magnified and obstacles and defects overcome that have resulted in a *really new civilization.*

I know perfectly that these words will not please many people in Europe. Great phenomena can only be judged accurately, however, from a distance. I do not mean physical distance, even though I am writing these notes from the middle of the Pacific Ocean, but mental distance. It is just this distance, by reason of the lack of an identical culture, that perhaps gives greater clearness to subconscious and basic instincts and permits unnamed multitudes to grasp the grandeur and power of the present North American civilization.

When I learn that a European worker or farmer has paid one or two thousand dollars to enter the United States fraudulently, I know that this represents a fortune to him. But I know, at the same time, that what attracts him more than the opportunity to make money is the condition of the new life.

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[2] *Bulletin* de la Société d'Encouragement pour l'Industrie Nationale, April, 1926. (44 rue de Rennes, Paris, France.)

[3] Translated from the French by Helen A. Carnes.

Of all the factors in the situation which my reflections have brought into the foreground of my thinking, I want to select three for consideration here. The first, and the most important, is the special economic and social status which has been attained by a great part of the wage earners in the United States. This deserves the greatest credit and is at the same time one of the most effective factors in establishing and maintaining prosperity. It has been very wisely written that "mass production cannot exist without mass distribution and mass consumption." I wish with all my heart that greater accord between the different social classes might be brought about and maintained. I have this wish first because of my sympathy with the North American nation: "Discordia maximae (res) dilabuntur." In the second place, I want the example of the powerful United States in due time (and this I naturally hope may be as short as possible) to have a real influence on the minds of Europe, minds that in some cases think, even in the year 1930, that the way to industrial prosperity is through reductions in wages.

The second factor is inherent in the belief, which is becoming more and more popular among North American industrial and commercial organizations, that scientific research is useful, I might even say necessary, to any real progress. Its importance cannot be exaggerated. In my opinion, this state of mind finds its correspondent—and complement—in the formation of groups attracted by the love of art in its purest and highest forms. Without science there can be no progress; without art—the poem behind the building—there can be no true loftiness of character for so rich and powerful a people.

The third and final factor is in my opinion the touch-stone. I detest rhetoric; and the worst kind is that which exalts any people to the point where it exaggerates its own importance and underestimates that of others. The surest way to checkmate this rhetoric is to state precisely, objectively and impartially all the factors in the situation. The situation in the United States is good, even very good; one can feel satisfied on that point. But pride without measure is not a good thing. Leaving out of consideration purely speculative crises, we must still think of possible dangers, of future inevitable difficulties. This idea was in the minds of the great leaders who planned the studies on "Recent Economic Changes" so that the lesser leaders might be brought to a state of mind where they would reflect and prepare for an even harder task. There is a popular saying in Italy that one must laugh while it rains and weep while the sun shines—weep while awaiting the coming of difficult times. I prefer to substitute for the word "weep" the words "be prepared for action."

I read somewhere in the two volumes of the study: Our men who are at the head of the procession must realize that the maintenance of present prosperity and its development in the future depend on their intelligence, their effort, their imagination, their capacity to adapt to circumstances and to make the most of them. It is true. In the life of a people as well as in the life of an individual it is necessary always to be prepared for the unforeseen. Dare I say that without obstacles, which must be overcome and which therefore stimulate imagination, an intense, creative life would lack the charm which it possesses? People, like individuals, are judged by their serious hours.

The great leaders furnish us with excellent examples of preparedness. I insist upon the plural. The great leader, the man of genius who furnishes a people with the decisive impulse at the critical moment, certainly has great importance. But the organic weakness of the man is such that, in spite of everything, he is not equal to the necessities of a people without the enlightened assistance of many.

In the domain of economics even more than of politics it is necessary to consider the growing complexities of modern life; the increase in the size of organizations of finance, of production, of distribution; the diversity of talents and useful capacities. Teamwork is a marked characteristic of our age. The discovery and development of superior individuals which is made necessary by this teamwork is called in the report the problem of leadership. To state a problem is to go three-quarters of the way toward solving it.

Is it possible that my examination of these volumes called forth only sentiments of admiration and consent? I have no hesitation in stating flatly that my answer is in general "Yes." I should fail in my cordiality to my friends in the United States, however, and in my habit of frankness, if I did not emphasize two points of doubt.

I trust that no one will be surprised that these points are of a psychological rather than of an economic nature. Even though I am an engineer, and I might say very much of an engineer, I persist in believing that psychological factors play a role of first importance in the life of the people, and that economic phenomena are but the consequences of instinctive acts of the leaders and the masses.

The problem of women is of the utmost importance. I greatly admire the position the United States has given its women. Woman is the flower of life and no care of her is too great. But she is also the foundation of the family and of society. That history which the great leaders of Rome knew how to devise in preparing themselves and the people for world organization is full of facts concerning the activities of women in critical times. Are these young North American women and girls, who spend so much time on frivolous things, in a way not befitting that most beautiful virtue of women, modesty, prepared to perform a useful action at the critical time? I have not studied the problem in such a way as to enable me to give a definite answer to this question, which is quite far removed from my province. It is very probable that the basic truth may be much more hopeful than certain appearances would lead one to suppose. I shall limit myself to citing two significant facts on this subject. The figures on savings in the United States indicate that the expenditures of the masses are less than their resources. The majority of women remain faithful, therefore, to the traditions of economy. And the considerable increase in the sale of machines and articles for the home, insofar as this means lighter and lighter work for the woman in the home (and this is good), is also an indication of a love of home which should not be underestimated. Last, but not least, is an article by Mrs. Coolidge which I have read with a great deal of respect. The ideas there expressed are the ideas of a woman of the great Roman tradition, those of the woman who is wife and mother—the most beautiful sentiments of all times.

A last question which has not in my mind been solved is the question of prohibition. I have no intention of entering into the merits of the thing here. Each people has the right to make the laws that it deems useful for itself, and no outsider has the right to pronounce in the matter. But when there exists in a country a law which is generally disregarded and violated, as is the case with prohibition in the United States, all this would seem to be an indication of something. Even if a law is admitted to be bad, a people is not great unless it knows how to amend the bad law; even if a good law is disregarded by an important part of the people, that people is not great that does not loyally observe its laws. It is so much the worse if the infraction of the law is deemed the privilege of money or of corrupt politics.

Am I wrong in closing my brief comments, necessarily incomplete and synthetic, with two notes of doubt? I think not. I am too much of an admirer of the present civilization of the United States and have too much confidence in its respect for liberty, in its love of progress, in its ability to realize its aims; I have too great a wish that other powerful people may more and more assimilate these great principles, not to have the courage to demand that the shadowy places be illuminated. The light will be all the more pure and beneficent.

Better Office Seating

A Report on the Activities of a Taylor Society Committee Looking Toward the Standardization of Office Chairs

By **HELEN A. CARNES**, Committee Secretary

ABOUT three years ago, at the suggestion of Mr. Davies, Assistant Secretary of the American Society of Mechanical Engineers, and as a direct result of that society's need for new office chairs, a small group of experts was called together by the Taylor Society to consider the possibility of bringing together the results of investigations on office chairs by individuals and organizations and of setting up, for the use of prospective buyers, standard specifications for office chairs. The committee has met only three times in the three years, but the general opinion is that it has been of real service to those represented in its membership. A summary of the minutes of the meeting held on February 28, 1930, is given here so that those outside the committee who are interested in the subject may benefit by some of its findings. This particular meeting was noteworthy because of the report which Dr. Wade Wright, Assistant Medical Director of the Metropolitan Life Insurance Company, presented on their researches in seating for office women.

The committee at present includes in its membership Lillian M. Gilbreth of Gilbreth, Inc. and the American Posture League, Pauline Goldmark of the American Telephone and Telegraph Company, Elinore M. Herrick of the New York Consumers' League, Harry Arthur Hopf of the H. A. Hopf Company, Chalice M. Kelly of the Union Carbide Company, B. K. Kenna of the General Electric Company, B. Eugenia Lies of R. H. Macy & Co., Inc., Freda Miller of the Women's Bureau of the New York State Department of Labor, J. J. Murphy of the American Telephone and Telegraph Company, G. A. Newton of the Western Electric Company, Minnie E. Preusser and Orin G. Sherman of the McGraw-Hill Publishing Company, Dr. Wade Wright of the Metropolitan Life Insurance Company, and the secretary. Mr. Davies, who has acted as chairman of the committee since its beginning, resigned at this meeting. Miss Goldmark was unanimously chosen to succeed him.

Mrs. Gilbreth first reported her observations on office seating during her recent visit as a delegate to the World Engineering Congress in Tokyo. She is anxious that the committee make contacts with visiting Japanese so that they may carry back with them more advanced ideas than they now have on all types of work seating. In order to adapt themselves to western industrial methods, which they are fast taking over, they are changing from sitting on the floor to the use of chairs. Unfortunately, however, there is some tendency to take over the worst rather than the best that we have to offer in the way of industrial seating. If the committee could meet with the groups of Japanese industrialists who plan to visit the United States this year she believes it could make a real contribution toward industrial progress in Japan. She is anxious also that the committee keep in mind the importance of the *work place*—chairs, arm rests, foot rests, machines—rather than just the chair.

Dr. Wright then reported on the study that has been engaging some of his attention over a considerable period. He has been interested for a number of years in industrial seating and until recently had been inclined to believe that the problems of shop and office seating were somewhat similar. His ideas on this subject have undergone a change, however, and he now sees a real difference between them. The problem is also very different for men and for women. Men have generally been responsible for both factory and office seating arrangements, and have perhaps not appreciated this difference.

The study undertaken by the Metropolitan was confined to women clerks. Cases of dysmenorrhea and other difficulties traceable to bad posture first pointed to the need for a posture clinic. This was set up under the direction of Ruth Hamilton, who had worked with Dr. Goldthwaite in Boston. Its special equipment included a booth for the making of silhouette photographs. A good deal of experimenting was done with lighting and the treatment of wall surfaces in order to secure the sharpest results in these pictures. Satisfactory silhouettes were finally achieved by placing the subjects about twenty feet from the source of light and taking the pictures against a three-inch mesh screen. The base and walls of the booth were treated with black velvet in order to diminish reflections. No objection was met in getting these pictures, as complete privacy was assured by the booth. They were found to be the most reliable source of information on body dimensions and configurations. With the clinic in operation the study of office seating went forward. Silhouette pictures of women chosen at random from the working group revealed a great deal of bad posture. The average working girl, especially in this part of the country, is not athletic, as is commonly supposed. Her bad posture and flabby musculature, which have been encouraged by the fashion magazines, make corrective work important.

Measurements were taken from these silhouette photographs in an effort to find out the actual dimensions and configurations of the female form, and therefore its seating requirements. A study of these showed that the Metropolitan women fall into three main groups, and they may perhaps be considered fairly typical of the women of this locality. The first group is young, small, slight and flat-backed, of Italian and Jewish extraction; the second group is tall and slender, the Irish type, and the third is mature and stocky.

Whether to use one adjustable chair or several different chairs for these varied groups was the question. It was finally decided, however, that a chair which suited the average and was adjustable to individual differences was the most practicable. All types of chairs were studied and their relative merits weighed before one manufacturer was singled out who agreed to make up chairs as they were whittled out in the medical department on the basis of the continuing studies of the posture clinic. Occasionally one of these trial chairs was put on the market by the manufacturer.

One of the features of the posture clinic was a "trick" chair which was devised to record lateral and vertical back curves. It was equipped with a flexible steel band which would conform to the curves of the back and provision was made for recording these curves on a drawing board mounted on the chair. It was found, however, that the curves which were secured by means of this device were not in the main borne out by the silhouette pictures. They were, however, together with the silhouettes, of some assistance in arriving at a composite height of waist and protrusion of the buttocks for the women studied.

A chair that seems generally suitable at this stage of the investigation was finally evolved and manufactured for one unit of workers. At first only twenty of the chairs were installed but later the number was increased by one hundred—a complete installation in a department. Its special features are its irons, the scoop of its seat — three-quarters of an inch in the deepest part which is farther back than in the ordinary seat — and the removal of the ridge at the back of the seat. The back is raised so high above the seat that it permits the worker to sit well back in the chair without interference. It is adjustable up and down and backward and forward, and is also narrower at the top than the ordinary back, so that it does not interfere with the arms in work. Every possible sharp edge and corner has been removed from the chair, with a consequent increase in comfort and an improvement in looks. This lack of edges permits the freedom of movement which should be possible in any chair.

A good chair should *favor* good posture and not force it. The feelings and emotions of the worker are as important as her physical well-being, and they require an allowance for freedom. The seat of this chair has been so scooped out as to keep the user *in it,* while at the same time it forces no particular position. The back exerts a gentle pressure at the proper place. Repeated adjustments of the height of the seat and the position of the back are made by sympathetic and informed adjusters. Each operator's chair is marked in a metal clip with her name so that she keeps the chair that fits her. And the fact that the whole department is equipped with this type of chair insures its use by everyone. The workers are, therefore, using the chairs and they appear to like them. There has as yet been no attempt to discover whether or not production has been improved by the installation, which was, incidentally, made in a model department.

Mr. Hopf asked Dr. Wright what he considered a criterion for judging a chair. Dr. Wright believes that if the chair is being *sat in* and is liked it can be considered reasonably good, regardless of production results. The judgment as to whether or not it is being sat in should be made by a trained observer, of course. Mr. Hopf would like to see a controlled experiment undertaken to prove whether or not the investment in a study of this kind pays in dollars and cents. Other factors, such as light, heat and ventilation, would of course have to be controlled also. Dr. Wright reported that there is a possibility that they may make such a controlled experiment. They hope also to check up eventually on the physical condition of the workers using the chairs.

One of the popular posture chairs was discussed. Dr. Wright objects to it on the grounds of mechanical deficiencies and its tendency to force a particular posture. Freedom to move about at will is desirable, and some change in position at least every five minutes is probably necessary because of the number of muscles involved in maintaining the balance of any position of the human body. Even in the relaxation of sleep about twenty changes in position occur during a normal night's rest.

Mr. Murphy asked if the back of the chair should move forward to support the desk worker who has to lean over her work. Dr. Wright considers support in this position unnecessary. It should be available when the worker leans back.

Mr. Newton of the Western Electric Company reported briefly on some experimenting of theirs with general office chairs and showed a picture of the chair they have finally adopted. It is based on a chair formerly used by the company, but the spindles of the back have been entirely remodeled to give much better support.

Mr. Hopf suggested the possibility of adjusting machines and desks, as well as chairs, to workers.

Miss Kelly reported briefly on some work she has been doing along these lines. She has been especially interested in a bookkeeping machine which was apparently designed with no thought of the comfort of the worker. There is a reaching strain attached to operating it and it is impossible to get the knees under it. She is trying to get the manufacturer to mount the machine on an adjustable stand which will permit the operator to use it either in a comfortable sitting position or in a standing position.

The committee in general was impressed with the importance of bringing to the attention of equipment manufacturers the necessity for considering human as well as mechanical factors in designing office machines. It was felt that there was enough prospective buying power represented in the committee to make it a powerful educative force. The possibility of sponsoring a research project, to which big equipment users might be induced to contribute financially, was mentioned but considered impractical at the present. It was thought most feasible at this time to have individual members of the committee take up specific problems with the manufacturers and have them undertake the necessary researches. They should be in a position, when presenting their goods for sale, to state not only how much product a machine will turn out in a given time but also the amount of effort necessary to turn it out and the conditions under which the machine must be operated. Members of the committee are in a position to point out many bad results of present equipment to the manufacturers, and could co-operate with them to great advantage in making the necessary inquiries. It was the consensus of opinion that this was an excellent immediate aim for the committee.

Mr. Davies suggested that the committee seek to give such work as Dr. Wright and Mr. Newton have been doing publicity in the journals of the office appliance people. It was also suggested that the editors of some of the trade journals be invited to attend the meetings of the committee so that publicity for its activities might be secured through them.

It was agreed by all that the group meet periodically for the exchange of information, that definite plans be worked out for approaching manufacturers of office equipment with suggestions for changes in their designs, and that the committee give its support to research projects such as those described in this meeting. It is hoped also that the scope of the committee may eventually be broadened to include other features of office layout.

Spring Meeting Program

Columbus, Ohio—May 1 & 2

Deshler-Wallick Hotel

Thursday Forenoon, May 1

General Administrative Organization and Control.
By Frederick L. Lamson, Assistant to the President, The Kendall Company, Boston, Mass.
Discussion led by John M. Carmody, Editor, *Factory and Industrial Management,* McGraw-Hill Publishing Company, Chicago, Ill.

Thursday Afternoon

Group I: The Major Sales Problems of 1930.
By Frank R. Goodell, Anderson, Davis & Hyde, Inc., New York.
Discussion led by Sidney U. Hooper, Operating Vice President, Hartman Furniture & Carpet Company, Chicago, Ill.
Group II: Basic Conditions of Effective Utilization of Facilities.
By Leslie E. Bryant, Armstrong Cork Company, Lancaster, Pa.
Discussion led by R. B. Bleecker, National Twist Drill & Tool Company, Detroit, Mich.

Thursday Evening

A 1930 Perspective of the Industrial Relations Problem.
By Whiting Williams, Author and Labor Relations Consultant, Cleveland, Ohio.

Friday Forenoon, May 2

Group I: Methods Study (including Time Study).
Leader of Discussion: King Hathaway, Manning, Maxwell & Moore, New York.
Group II: Managing Hand-to-Mouth Selling.
Leader of Discussion: Ralph W. Langley, Production Engineer, New Haven, Conn.
Group III: Functional Organization of Executive Responsibility.
Leader of Discussion: C. S. Carney, Vice President, Trundle Engineering Corporation, Cleveland, Ohio.

Friday Afternoon

Group I: Maintenance of Materials and Equipment Standards.

Leader of Discussion: George D. Babcock, Vice President, Central Lumber Mills, Inc., Fletcher, N. C.

Group II: Developing New Items and Channels.

Leader of Discussion: S. W. Van Ness, Director of Merchandising, Dennison Manufacturing Company, Framingham, Mass.

Group III: Measuring and Rating Management.

Leader of Discussion: Walter Rautenstrauch, Professor of Industrial Engineering, Columbia University, New York.

Friday Evening

Management Problems of the Next Decade.

By David Friday, Economist and Writer, A. G. Becker & Company, Investment Bankers, New York.

News of the Sections and Notes

Central New York

The group held its February meeting on the fourteenth at the Hotel Syracuse in Syracuse. Mr. Wallace Waterfall, Secretary of the Acoustical Society of America, spoke on "The New Science of Noise Control," and its application to factories, offices, public buildings and homes.

At the meeting on March 21 Henry P. Kendall, President of The Kendall Company and of the Taylor Society, was the speaker of the evening. His subject, "How Scientific Management Has Been Helping Textile Readjustments," aroused keen interest.

New York Metropolitan

Mr. Kendall also addressed the New York Metropolitan Section of the Taylor Society on Thursday, March 20. He chose as his subject a description of a piece of reorganization work which has recently been completed in one of the new divisions of The Kendall Company in Chicago. Mr. F. G. Coburn, of Sanderson and Porter, and Henry C. Metcalf, of the Bureau of Personnel Administration, participated in the discussion of this concrete case of an application of scientific management principles.

University of North Carolina

Under the guidance of Professor Schwenning, the local branch of the Taylor Society, the North Carolina Club and a seminar of the department of commerce were responsible for arranging a meeting at which Mr. Kendall again spoke on "Management Problems in the Textile Industry." This was one of a series of University meetings planned to afford the students an opportunity to hear all sides of the textile situation.

Erratum

In the last issue of the BULLETIN (February, 1930), the caption accompanying the illustrations of the Le Chatelier medal, opposite page 38, twice referred to the International Management Congress in Paris last June as the *Fifth* International Management Congress. *Fifth* should in each case be changed to *Fourth*.

Back Numbers Wanted

The following out-of-print numbers of the BULLETIN are in demand for completing sets for libraries, etc. We shall be glad to pay fifty cents each for any or all of the following numbers for which we have especially urgent requests:

Vol. VI, Nos. 1, 5 and 6
Vol. VII, Nos. 2 and 4
Vol. XI, No. 1
Vol. XII, Nos. 4 and 6

Reviews

Industrial Standardization. National Industrial Conference Board, Inc., New York, 1929, pages xiv, 306.

This study is a contribution to the entirely inadequate non-technical literature on the important subject of Industrial Standardization. Much of a technical nature has been written upon standards in individual industries and upon various engineering standards, but little has been done in summarizing the status of industrial standardization, except what has been presented in the somewhat limited space of the always valuable and interesting Year Books of the American Standards Association.

This study is divided into two parts. Part One gives a summary of the activities of the more important organizations interested in developing and promoting Industrial Standardization, not only in the United States, but also abroad. Persons who have not had the opportunity to become closely associated with the standardization movement will, no doubt, be greatly impressed by the very considerable amount of work being done by individual companies, trade associations, engineering societies and national and international standardizing bodies.

Part Two is devoted to a discussion of the economic aspects of standardization. In this part an evaluation of the business saving from standardization is made. The relationship of standardization to marketing technique, to the size of business, to the ultimate consumer, standardization as an aid in the stabilization of business, are the subjects which are discussed in some detail. The appendices contain carefully selected material and add to the value of the study.

It is to be regretted that in a study of Industrial Standardization, it was not found feasible to devote even as much as a single chapter to the discussion of the very important subject of the establishment of operating standards. It is felt that too narrow a definition of the term, scientific management, is used in order to justify this omission.

This study fills a definite need for a non-technical book presenting the existing status of industrial standardization in a way that can be understood by all.

V. S. Karabasz[1]

Wage Incentive Methods, Their Selection, Installation and Operation. By Charles Walter Lytle, M.E., The Ronald Press Company, New York, 1929, pages vii, 457.

From the multiplicity of known wage incentive plans the author has selected twenty-five which he has subjected to a painstaking study with a view to so presenting their various features that comparison will be facilitated and the executive assisted to a decision as to which plan may best meet the needs of a given set of conditions. To this end numerous charts are presented showing wage cost or operators' earnings for various percentages of a "standard production" and also the variations in total cost for given rates of production under the various plans. Some of these charts by reason of the number of curves and small scale of reproduction are difficult to read. Interesting statistics are given on the extent to which various incentive wage plans are used as well as reports on the experience of many representative companies.

In commenting on the number of plans that have been devised the author states, "The worst that we can say of the better pioneers is that they tried too many variations and attached their names to plans which were not sufficiently distinct to justify any new names." The reviewer joins with the author in the expressed hope, "that the past tendency to diverge from well established plans will either cease or else new plans in the future will be so distinctive that they will really serve special purposes. Only 'fond parents' would claim this for some of the twenty-five plans."

The author points out the need for standardization, planning and control, maintenance and inspection in connection with incentive pay systems. Incentive plans for groups of employes, quality bonuses and incentive plans for those engaged in supervision office work and other indirect capacities are described.

The chapters dealing with base rates of pay and the relative evaluation of different classes of work should be of assistance to employers in checking up their own practice.

The difficulties with which the author had to contend and with which the reader is also required to cope are not limited to the number of plans dealt with. They are heightened by the fact that several of the plans may be varied in such details as what should be regarded as "standard," or 100 per cent production, the point in the scale of production at which "premium" or "bonus" earnings should commence, and the ratio of these to base earnings. Furthermore, as the author points out, "According to Lichtner the task used by Barth, Baum, Halsey and Rowan would allow performance of 200 per cent" and "under the Emerson plan a large number of employes will produce from 125 to 150 per cent of standard. Under the Taylor and Gantt plans production of more than 110 per cent will be very rare." As a consequence of the different objectives, manners of establishing standards of performance, plans of organization, systems of management and general state of affairs that the originators of the various plans had in mind, it is no easy matter to avoid confusion in analyzing and describing twenty-five plans and to present the material so that every plan may be compared with every other plan. The reviewer, in spite of long experience with a variety of incentive wage systems, felt somewhat bewildered after a first reading of the book. It is a question whether the majority of executives, who should benefit from this work, will have the perseverance necessary to an understanding reading.

The book would, in the reviewer's opinion, have been of far greater value if it had been more logically arranged and simplified in its manner of presentation. He also is of the opinion that this is something more easily said than done.

The author refers frequently to the work of Taylor and his associates, both directly and in connection with the practices which have spread from that source. But, although he does not neglect it, he fails to bring out adequately what Taylor indicated as a basic difference between the task idea, the essence of his differential Piece Rate System as well as of the Gantt Task and Bonus Plan, and what he termed the "Drifting Systems." This distinction the reviewer feels cannot be too strongly nor too frequently emphasized. As the task idea is essential to true scientific management, and as virtually all of the plans other than those devised by Taylor, Gantt and Merrick evade the task idea with the responsibilities that it imposes, it is not probable that the book will have much influence in raising the standard of management from what Kendall has described as the systematized stage to the scientific; in other words, in raising it from a diluted and distorted form to one conforming to the principles of scientific management with its correspondingly greater effectiveness.

Although many of the practices described as a part of incentive pay systems bearing other names will be recognized as appropriations or adaptations from Taylor technique, the fact that the majority of the plans presented were devised to fit systems of organization and management with standards and practices far below those of scientific management, as conceived and applied by Taylor and his associates, detracts from the true importance of the few which are specially designed to fit scientific management standards.

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[1] Assistant Professor, Wharton School of Finance and Commerce, University of Pennsylvania, Philadelphia, Pa.

One gains, however, from a reading of this book an idea that the trend, as indicated by the author's investigations, is toward more exact and thorough analysis of work, standardization of equipment and conditions, planning and control, and that standards of production are therefore being fixed at levels more nearly approaching the task which is suitable to what Taylor designated as a "first-class man." When this point is reached, and as management advances from the systematized to the scientific stage, there ceases to be any value in those schemes under which incentive pay starts at a point below such a standard and contemplates production in excess of a rate set by the management. Hence it may be expected that as economic pressure forces industry toward an understanding and application of the principles and practices advocated by Taylor, a majority of the systems analyzed will pass out of the picture.

KING HATHAWAY[2]

Managerial Profit Sharing. By C. Canby Balderston, John Wiley & Sons, Inc., New York, 1928, pages xiii, 127.

Now—when business has been going through the process of incorporation—when owners are no longer running their companies but have corporate officers to manage for them —executives' incentives become a subject of major importance. People who have watched business houses grow and decline, who have studied what makes stock values and what factors produce high credit rating, realize the importance of the personalities of the administrative group. The most scientifically organized company with the most efficiently equipped factory will not make a success of its business if its executive staff is deficient. Many poorly organized businesses have made huge successes.

This is a day of change. Not only is mechanical and chemical invention progressing at a fast pace, but methods of distribution are undergoing profound alterations. The company which does not keep at least one jump ahead of the pack finds itself in the midst of a mob of competitors fighting fiercely for markets that are inadequate to go around. Not only must we have capable men to guide the affairs of a company but we must offer them incentives to lead the organization out ahead of its competitors where it can get the first choice bits from the markets.

A salary, even a munificent one, is an incentive to be conservative. The salaried officer can keep his job and his salary as long as he plays safe and does what he is told. That was sufficient when markets were adequate and the only task of the executive was to keep his company in business and not make too many mistakes. Two decades ago an "average" concern could make satisfactory profits.

Today a business cannot afford to "play safe." It must experiment with new methods and develop its own new ideas. A negative executive who makes no mistakes is not enough. He must have more than the negative incentive of keeping his job. It must be made to be worth his while to develop it. But without a stake in the rewards of effort he would be foolish to take chances and try experiments. Fear of being fired is not the kind of incentive to make a leader. He should have the incentive of an owner—a share in the profits he wins.

Professor Balderston has produced a valuable little handbook of managerial profit-sharing schemes. He has collected and given descriptions of the plans of leading concerns. Moreover he has shown in simple, clear form wherein the various types are effective and has indicated certain dangers. The plans must be fair. Classifications of subexecutives must be so made that jealousies and schisms will not be created within the ranks of the organization. It is to be hoped that he may some day expand his brief conclusions on the limitations and scope of executive profit sharing.

He divides his study into five parts:

First, "The place of managerial profit sharing as one form of extra compensation for executives." In that section he draws from a wide range of expert opinion to indicate how and why executive profit sharing is being used.

Second, "Evidence that managerial profit sharing is effective," in which he evaluates various types of profit sharing schemes and presents a strong collection of opinions of executives who have experimented with the form of incentive.

Third, "Form or structure of actual plans," including a descriptive chart of thirty-five plans mostly in American companies but also including one English and two French plans.

Fourth, "Discussion of improvements in technique." This section contains comments on the reasons for effectiveness and, more especially, on the dangers and weakness of various details of the several generic types of plans.

Fifth, "Conclusions," containing suggestions for effective installation of managerial profit sharing.

The appendix contains another chart showing the set-up of sixty-five plans now in use, and further notes on the relation of managerial profit sharing to the function of management.

This handbook of executive profit-sharing technique should prove useful for the many companies approaching the problem of selecting payment methods to attract and produce leaders for their organizations.

GORTON JAMES[3]

Introduction to Business Management. By Herbert G. Stockwell, Harper & Brothers, New York, 1929, pages xiv, 276.

This book of Mr. Stockwell's has a double purpose. Its primary service is to point out to the young man anxious to advance himself into positions of high responsibility and greater opportunity, the special abilities and characteristics of work that make for success in the different fields of business activity. The author dwells upon the development in the individual of the capacity to manage other men, but recognizes that the qualities of leadership which one may possess must be further supplemented by knowledge of the jobs themselves. The second purpose, therefore, becomes one of explaining the nature of the principal functions of a business enterprise in which the major executives are engaged.

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[2] Manning, Maxwell & Moore, Inc., New York.

[3] Editor *Business Week*, McGraw-Hill Publishing Company, New York.

The chapters devoted to the president, the factory manager, the sales manager, the treasurer, the personnel manager, the purchasing agent, the advertising manager, the office manager, the cost accountant and the branch manager, contain many practical suggestions as to the conduct of their respective functions. Emphasis is put upon how the individual should adapt himself to the job rather than upon the technical phases of management. Other chapters treat of the attitude toward business which one should adopt, a sound discussion of business ethics touching common business practices, the extent to which luck and opportunity play a part in the individual's success, and the purely personal factors which are within the control of all men, such as, personal appearance, good manners and habits.

Mr. Stockwell's advice is sound. The book makes pleasant and wholesome reading; it is not technical and difficult, and defends no set system or method. It should be stimulating as well as of practical value to the ambitious young man in accomplishing the worth-while things upon which sound business administration is based.

N. G. Burleigh[4]

Accounting for Executive Control. By Monard V. Hayes, Harper & Brothers, New York, 1929, pages xvi, 495.

The advances in the field of accounting have come with such rapidity in the last decade that only the most progressive management has been able to understand them and put them to use. It is no longer limited to the preparation and interpretation of the balance sheet and the profit and loss statement, but has become one of the most efficient tools of management in determining the future policies of a business. The function of accounting has ceased to be merely that of recording historical data and has become that of providing an active control device of the greatest importance to the proper development of the organization.

In spite of the rapid increase in the literature of accounting there has been relatively little added to the advancement of the subject. Authors and writers have usually devoted their attention to the presentation of the theory or to the discussion of some pet interpretations of their own instead of pointing out its value as a guide to the future. Because these writings have been used by a majority of the teachers of the subject the student has been led to regard it as an end in itself instead of as a means to an end.

To those who have been accustomed to looking upon accounting as an end in itself as well as those who have followed its more advanced developments this book by Mr. Hayes should prove exceedingly valuable. He has very clearly set forth the place it should occupy in the business organization and has also provided a vast amount of illustrative material which enables the reader to follow his discussions with a minimum of difficulty.

The outstanding factor of this book is the author's acceptance of scientific management and its relation to accounting as pronounced by Frederick W. Taylor and his associates. In the early chapters he refers frequently to the philosophy developed by Taylor and makes it the basis of his principles of management control through accounts. In fact his main thesis seems to be the setting and maintenance of scientifically determined standards for the purpose of control.

Although Mr. Hayes has attempted to cover too much ground, thus making it necessary for him to slight some very important elements, this book is perhaps the most outstanding work to be published in the field of accounting for some time. It is an extremely valuable contribution to the literature of accounting and management. It should be read by all who are interested in the advancement of scientific management.

Philip E. Henderson[5]

Economic Principles of Consumption. By Paul H. Nystrom, The Ronald Press Company, New York, 1929, pages xi, 586.

Business executives and other students of distribution problems will find this pioneer work in the principles and known facts of consumption of absorbing interest and practical value. Dr. Nystrom's wealth of experience, lucidity of style and deep insight into the fundamentals of modern retailing combine to make this book an outstanding contribution. Although there is copious use of statistical material, the presentation is so skillfully done that the reader is not wearied or bewildered with the imposing array of pertinent facts.

The chapters dealing with the standard of living and classification of standards are distinctive features. Historic changes, geographical variations, occupational and social variations, differences due to education, natural ability, size of the family and wealth and income are factors which profoundly influence the standard of living and each factor receives appropriate emphasis. The classification of standards of living into ten grades ranging from public and semi-public charges to the liberal standards with estimates of the percentage distribution of family expenses, the number of people in each class, and the income necessary to support each standard is particularly helpful as a cross section of our national well-being.

In the chapters dealing with family expenditures for food, clothing, housing, home furnishing and home operation, health maintenance and leisure, there is assembled a mass of authoritative information which should be invaluable to manufacturers and distributors who plan objective merchandising. Chase's estimates of national expenditures for leisure activities are modified by later information which was available to the author. There is also an interesting chapter on savings. The book is concluded by a chapter

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